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ENGLISH MILCH GOAT.

# **The Book of the Goat.**

CONTAINING

PRACTICAL DIRECTIONS FOR THE MANAGEMENT OF THE  
MILCH GOAT IN HEALTH AND DISEASE.

ILLUSTRATED.

BY STEPHEN HOLMES.

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# The Book of the Goat.



## INTRODUCTION.

WHEN cows' milk is sold for 4d. and 5d. per quart, and is even then more or less adulterated with water, it is surprising that goat keeping is not carried on more generally than it is. We read of goats in former times being kept extensively, both for milk and flesh, a young kid, indeed, being considered a great delicacy; but in these days such an animal is looked upon almost as a curiosity, few people having tasted its milk, and probably not one in a thousand ever having eaten its flesh. That they are not now seen in the numbers they once were is no doubt greatly attributable to the fact that land is every day becoming more enclosed and cultivated, and we no longer see the vast tracts of waste grass land that once abounded in England; but though this may account for these animals not being met with in large herds, there is no reason why they should not be kept singly or in pairs, like cows, for the sake of their milk and flesh. There are many people who have not the means and space to keep a cow who might easily keep a goat with the same advantage, or even more, on a smaller scale, the latter requiring far less care, needing but a small outlay, and giving but little trouble in their management. There are few places in the neighbourhood of London where, if no common exist, there are not plots of unused grass land waiting to be built upon, where, by permission, or even without, a goat could be turned on to feed; in fact, I know of instances where they are profitably kept by persons who have not even that advantage, but keep them constantly in a stable or out house, taking them out occasionally for a breath of fresh air and exercise, and feeding them on refuse scraps and vegetables, without any pasturage whatever. I believe there are many families who would gladly keep a goat if they knew the advantage to be derived from it; and probably others who, knowing the advantage



have often "talked of having one," yet refrain from carrying out their intention, because they would not know how to manage it, having no friend to inform them, and there being no work or handbook published, as far as I am aware, to guide them. I purpose, therefore, in the following pages to write a full and practical account of the management of goats, stating how to feed, breed, and milk them, and showing the advantage and profit to be derived therefrom.

## CHAPTER I.

### VARIETIES OF GOATS.—SELECTING A MILCH GOAT.

THERE is, probably, no animal (the dog excepted) which has a greater range of variety than the goat. It is met with in most parts of the world, and appears as much at home in the cold regions of Norway and Sweden as in the hot countries of Asia and Africa. I will, however, merely enumerate a few of the different foreign varieties, and consider only those most generally kept in this country, adding a few hints to my readers how to select a good and useful animal. Of the foreign varieties, the Jueda, Persian, Nepaul, Syrian, and Egyptian goats are but little known, except in the countries where they exist. The Thibet, Angora, and Cashmere goats are remarkable for the fleecy character of their hair, which is very long and of a beautifully soft and silky texture, valuable for manufacture into fabrics; the wool from the last-named animal forming the material for the famous Cashmere shawls. Several specimens of this variety were sent from Persia to France about fifty years ago, four of which were purchased and brought over to England by C. T. Tower, Esq., of Weald Hall, Essex, who kept and bred them successfully for many years, and had three shawls manufactured from their fleece. At his decease, in 1867, however, the whole stock was sold by auction, they having at that time greatly degenerated through in-breeding. There is another foreign variety, the Surat goat, which is kept very largely in India; they are perfectly white, with long pendulous ears, and are said to give large quantities of milk. Some of these animals may sometimes be obtained at the London Docks, where they arrive from India, having been made use of during the voyage to supply milk to the passengers on board the vessels. Specimens of the Angora goats, more or less pure, are also occasionally seen in this country, but I believe they are kept more as a "fancy" than for any special quality they possess, being but indifferent milkers.

In Great Britain each country seems to have its own variety. We have English, Welsh, Scotch, and Irish goats; the two latter closely resemble

each other, the only difference being in point of size, the Scotch being rather smaller. The Irish are mostly large animals, with long shaggy coats, generally of a mixed black and white colour, rather short ears, and horns pointing upwards; they have the character of being good milkers but their appearance is by no means prepossessing; large numbers are imported from Ireland annually into this country. The genuine Welsh goat is also of considerable size, and remarkable for its large horns and long hair, which latter is mostly white or whitish in colour; the horns have a tendency to curl downwards.

With respect to our own particular variety I have seen many goats which were called English but which as much resembled the Irish and Scotch as those animals themselves; the true English breed, however, is by no means easily obtainable, the reason, doubtless, being that they have been so much crossed and interbred with other varieties that their distinguishing features are to a great extent obliterated. I have myself been at considerable pains to procure a good specimen, but it is only within the last year that I succeeded in obtaining one whose pedigree I could trace. The English goats proper have a much shorter coat than the other breeds, varying in colour from a pure black to a handsome fawn, more or less mixed with white; they are large sized animals, with rather long ears, and a neat head, the horns having a tendency to grow in an outward direction. They are far handsomer than the other breeds, the specimen I possess more resembling a deer in appearance; its head is gracefully set on its shoulders, and it has altogether a more noble appearance than goats generally possess. English goats are considered excellent milkers, though I myself believe this quality to be more confined to individual animals than to any particular variety, as cross-bred goats often give large quantities of milk.

It is much to be regretted, but certainly a fact, that goats in this country are gradually degenerating; it is rarely or never that a good specimen of any kind is seen, those most commonly met with being a mixture of several varieties and of diminutive size; the result of being allowed to breed when only half grown, and before the age of maturity has arrived. The only means of remedying this is to do with these animals as has been done with dogs, fowls, and rabbits, namely: to breed them for competition and introduce them into our cattle shows. I believe goats are at the present time the only domestic animals which are not exhibited. Fifteen or twenty years ago no one thought of exhibiting dogs and fowls, much less rabbits and cats; but since the rage for keeping fowls, pigeons, and rabbits, there is scarcely a town in England of any importance that has not its annual poultry, pigeon, and rabbit shows. The result is that

the breeds of these animals have been greatly extended and improved ; let us, therefore, hope that as goat-keeping becomes more general we may one day see these equally useful creatures figure in our catalogues, when an improvement in their breeds also will soon become apparent.

Having given a brief sketch of the various kinds of goats, I will now proceed to state the outward and visible signs that should denote a good animal. There is such a vast difference in the quality of milch goats, especially regarding their milking properties, some producing a so much larger quantity than others, that considerable care and judgment should be exercised in order to make a good selection. Those answering the following description will generally be found to be the best : As large as possible in size, with small compact head, broad at the forehead, and narrow about the muzzle, eyes large and prominent, the shorter the horns the better (those devoid of any being usually very good milkers), ears large and somewhat pendulous. The hair of the body should be tolerably short, hard, and stiff, and not too abundant.

Regarding colour, the black goats have the character of being the best, though as far as my own experience is concerned I do not think this much affects its milking properties. Particular notice ought to be taken of the udder and teats, which in a good milker are very large, causing the animal to have quite a peculiar gait in consequence of widening the space between the thighs ; large teats are almost as essential as a big udder, as not only is it a proof of plenty of milk, but the operation of milking is greatly facilitated. These last features are the most important, and should therefore be considered first.

The age at which a goat should be chosen is between two and three years old, after it has just borne its second kids, as the amount of milk given on the first occasion is comparatively small. If the goat has not arrived at her second year, being then with her second litter, she must have had her first kids at too early an age, and before her growth was fully developed, so that she would be stunted in size in consequence. A pretty accurate estimate of the age of a goat may be obtained by looking into its mouth and examining the teeth ; like sheep and cows, these animals have no incisors in the upper jaw, but only in the lower, it being by these that the age is to be ascertained. The mouth of a goat aged one year contains its full complement of teeth, thirty-two in number—namely, six molars on either side of each jaw, and eight incisors, or front teeth, in the lower jaw only. These are of small size, and rather pointed. In the second year the two centre ones fall, and are replaced by two new ones, these latter being easily distinguishable by their size, they being considerably larger than the other six. In the third year two more small teeth, one on each side of those

already changed, are replaced, so that at that age there are four large incisors in the centre and two small ones at each end. In the fourth year the large teeth increase to six in number, and only two small ones, one at each end, remain. Finally, when the goat reaches her fifth year, these in their turn fall, and are replaced, and she has then what is commonly called a "full mouth." It will be seen by this that once in possession of the above facts anybody may without difficulty tell the age of the goat they are about to choose up to five years old. After that time the means of ascertaining the age are less sure, the only plan then being to examine all the teeth generally, but particularly the molars or grinders, the more these are worn the older the animal may be presumed to be. At seven or eight years the front teeth begin to break and fall out without being replaced, so that a goat with one or more incisors missing, the rest being worn and broken, may be fairly assumed to be old and nearly useless, and should therefore be rejected.

Another matter to be considered in selecting a goat is its health; nothing is more disheartening than when buying an animal of any kind which you imagine to be in perfect condition to find it in a dying state, perhaps a day or so after. In my youthful experience of rabbit keeping I recollect such a thing was of frequent occurrence, and although goats are not subject to the same diseases as rabbits, and are as a rule healthy creatures, still, to avoid anything of the sort—as there are always unscrupulous persons ready to take advantage of the uninitiated—it may be useful to many of my readers to know how to detect a goat in health or sickness. When ill, these animals have a mournful dejected appearance, their breath is offensive, and their gums of a pale colour; their appetite is bad, and they lose generally that vivacity and sprightliness of manner which are so characteristic of them when well. When in good health, on the contrary, they carry their head erect, their eyes are bright and sparkling, with a cheerful expression, their nose dry and nostrils moist; their breath is sweet, and their mouth and gums a bright red. Another sign by which their condition may be known is the vein of the eye. This may be examined by raising the upper lid with one thumb and pulling down the lower lid with the other. If the vein in the corner of the eye be a bright red colour, the goat may be considered to be in good health.

Considerable advantage may be derived by keeping two goats instead of one, the amount of time and trouble required being scarcely any greater, whereas the profit derived is more than double. The best plan is to begin by purchasing one that has just kidded, and when that is becoming dry, to procure another just about to kid, by this means a good supply of milk will be always kept up.

In buying a goat, as in buying a horse, some experience and judgment are absolutely necessary to prevent a person from being defrauded, more especially if it be desired to have one that will shortly kid, "nannys" having often the appearance of being in an interesting condition when, in fact, they are nothing of the kind, the *enceinte* appearance often being caused by a surfeit of green food eaten wet. Again, as regards the quantity of milk they are said to give, unless the seller be a trustworthy person, whose word and honour may be relied on, it is best not to take for granted that "she gives two quarts a-day," as you may be very likely told; or you will, in all probability, after having paid your money and milked your goat, find she gives barely one. Having, in my early experience of goat keeping, suffered all these disappointments, these few words of caution may be useful to prevent others from being served in a similar way. In selecting a goat in kid, therefore, it is advisable to buy of some one whom you can trust; but if the seller be a stranger, and you have no friend on whose knowledge you can rely to assist you, enlist the services of your milkman, who will, in all probability, be able to give you good advice. In all cases I would advise an intending purchaser to see the animal milked before paying his money; there will then be no doubt about the quantity given.

As some "nanny" goats are spiteful and bad-tempered, and consequently troublesome at first, especially to milk, if those who will have the care of them are women or children, it would be best to begin by purchasing a young female kid about six months old, always supposing, of course, that you are not in immediate want of the milk, and can afford to wait a year before she becomes productive; by doing this you get an animal which will soon, by kindness and good keeping, become as tame and docile as a lamb, being almost as much attached to its master or mistress as a dog. In such a case it is more than ever necessary to buy from some one on whom you can rely, it being essential to ascertain the respective qualities of the parents. Endeavour to obtain one whose sire and dam come of good milking stock, possessing quiet even tempers; an unprepossessing looking animal, with a good pedigree, being far more useful than never such a handsome one without.

It may not, perhaps, be out of place, in concluding my remarks on this head, to state the various prices which should be paid for goats of different qualities in England: a large well-bred English goat from two to four years old, in full milk, giving two quarts a day, is worth from £2 5s. to £2 10s. If she give a greater quantity, the price may be expected to be more in proportion; if less, I should consider £2 sufficient. Any goat giving two quarts is well worth that sum, be she large or small. When

dry, a similar animal would fetch 10s. less; from 30s. to £1 15s. is about the average price for an ordinary goat giving two or three pints a day. A good-sized kid, at six months old, usually fetches 10s. or 12s. It must, of course, be understood that prices vary according to circumstances, such as age, breed, parentage, &c., it being impossible to state the exact value of any animal, without knowing its individual qualities.

## CHAPTER II.

### THE GOAT - HOUSE.

HAVING purchased a goat or goats, the next question is, where to keep them? Some people may remark that, being hardy animals, anything in the shape of a covered shed will answer the purpose of a shelter for them; so it might, no doubt, but with me my goats are my hobby, and I desire for their habitation something more than a mere shelter, particularly as while milking and feeding them I spend some time in it myself, and I should look forward to such operations with anything but pleasure if they had to be performed on a cold winter night in an exposed and draughty shed. Those contemplating keeping goats will find the interest they take in their management more than doubly increased if they have a clean and comfortable place in which to attend to them. Persons having an empty stable need of course no further accommodation, and only require to make the necessary alteration in the position of the manger or feeding boxes, to suit the height of the animals, and the thing is done. There are few residences that have not some kind of outhouse, which, with a little contriving, could be made into a comfortable goat house of a more or less substantial character; but to those who have not such advantages, and are obliged to construct one for themselves, the following hints to guide them will be serviceable. The cheapest form of building will be a "lean-to," advantage being taken of the angle of a wall to erect it against, if such presents itself; by so doing extra shelter and warmth, besides a saving of material, will be effected. The dimensions I am about to give will easily accommodate two goats, the cost of making being little more than for one, and I have already shown the advantage to be gained by keeping a pair. Even should a single animal be the intended inmate, the increased space afforded will be found advantageous when an addition to the family takes place, and the kids make their appearance. The building should be 5ft. wide by 7ft. long, the length being divided as follows: 1ft. for the width of the manger, 4ft. for the length of the goat, and 2ft. for a passage to contain the few implements required



for use in the stable. The height nearest the wall should be 7ft. 6in., the opposite side being 5ft. 6in., which gives a slope of 2ft. to the roof; this may be either tiled or made with wood, over which is laid a covering of felt. The latter plan is certainly the warmer as well as the cheaper of the two, besides being lasting, for good felt properly tarred when laid down, and retarred every second or third year, will stand nearly twenty years.

In constructing a building that is intended for the habitation of animals, great attention must be paid to one important point, viz., ventilation, without due regard to which no creature however hardy is free from the attacks of disease in some form or other. Means must therefore be provided to allow the escape of the heated foul air, admitting at the same time a corresponding amount of pure air to take its place. Care must be taken, however, to avoid any direct draught upon the goats, which would probably have an injurious effect; although hardy, as a rule they are sensitive to cold. Various means may be adopted for ventilating the house, such as the use of air bricks or louver boards; but in a building the nature and size of which I have described, nothing will be found easier to fix, cheaper or better, than pieces of perforated zinc, which should be placed in the highest part of the stable, just under the roof, another piece being inserted at the lower part, a few inches from the floor just below the manger, thus causing an almost imperceptible current of fresh air to be admitted close under the animals' nostrils.

A good sized door about 2½ft. wide running up to the roof will be required; also a window to admit light and extra air when necessary. One that opens by turning on a pivot in the centre will be found as cheap as any in construction, besides being easily opened and shut.

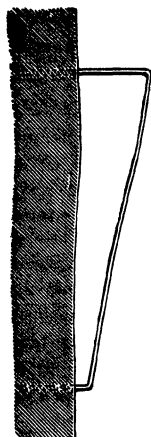
For the floor the best material is concrete, it is cheaper than bricks, and is not liable to be broken by the hoofs of the animals; moreover, being of a hard and smooth surface it is easily kept clean. Care should be taken when laying it down to allow full time for the cement to set before being trodden on; about twelve hours is sufficient for this as a rule, but in a damp place it will take two or three days before it becomes thoroughly dry and hard throughout. The floor must be raised about 2½in. from the level of the ground outside, to prevent the wet from entering under the door; it should also slope gradually from the manger to the entrance, which will be found of great assistance when flushing it with water, which requires to be done occasionally in summer. A small quantity of Condry's fluid mixed with the water for flushing is valuable in deodorising and purifying the place.

A good bed of straw should be supplied, which ought to be shaken up every day; a little sawdust, when cheap and easily procurable, is useful in

absorbing the moisture, or, what I find almost better, a layer of dry sifted earth—this having the further advantage of fixing the ammonia. Which ever be used should be laid *under* the straw. In summer the goathouse should be cleaned out every day, but in winter twice, or even once a week, I have found sufficient if the weather be cold, as the ammonia does not then rise so freely. Any unpleasant smell may be got rid of by sprinkling every day a shovelful of fresh earth upon the droppings, and laying over plenty of clean straw; by this means the stable will be kept clean and sweet with little trouble. The object of the straw is not so much for the sake of the goats (in summer especially they would be better without it, these animals in their native state being accustomed to lie on hard and barren rocks), as to form with the urine and dung what is commonly called stable manure, which is such a valuable fertilizer for the garden; it has also the advantage of keeping the teats from being soiled by coming in contact with the dirty floor. It is chiefly necessary to lay the straw about the hind quarters of the animals, spreading only a small quantity in front; by so doing they will be kept cool and comfortable, both excess of heat and cold being prejudicial to them.

The next thing to be considered is the manger. A proper wooden feeding trough is best; but what answers the purpose very well is a long box, 6in. deep and 1ft. wide, the only objection to this being the corners, in which food such as bran and meal is apt to collect, and turn musty. It should therefore be frequently brushed, and now and then washed out. The box should rest on a board raised about 6in. from the ground, to suit the height of the goat, and it should fit close to the wall, in a space boarded off to contain it, no room being left for the corn to fall through and get wasted. In my own goat house I have arranged an apparatus at the manger, by means of which I secure the heads of the goats when being milked. This, however, I will explain at length when writing on the subject of "milking." I will now describe the means of fastening up the goats in the stable. Each goat should have a strong leather collar, fitting loosely round its neck, to which should be attached a short chain about 12in. in length, with a spring hook furnished with a swivel at the end; a large staple being driven well into the wall close to the manger, the spring hook can be slipped into its and the animal is firmly secured without trouble or delay. The chain may appear somewhat short, but it is quite long enough for the purpose, as, if too much freedom be allowed, the goats are very liable, especially if strangers, to fight, and eat each other's food; they merely require enough space to enable them to feed and lie down comfortably. The above is the simplest form of fastening, but another and preferable method, which I have myself adopted, is as follows: Instead of the staple, I have an iron

rod 2ft. long and not quite  $\frac{1}{2}$ in. in diameter, bent at right angles at each end, as shown in the woodcut (Fig. 1); the ends being pointed or wedge-shaped,



are driven into the wall, the lower to within an inch and the upper within three inches of the angle, thus giving the rod an oblique position. Into this rod, instead of the staple, the spring hook can be slipped, it having this advantage over the latter, viz., that, instead of being fixed, and therefore curtailing the distance when the animal stands up to feed, the hook, as soon as the goat tightens its chain, slides up the inclined rod and gives it the same length as when lying down. Where any difficulty is experienced in obtaining a bar of iron, an ordinary iron curtain rod answers the purpose very well, the trouble of bending it being avoided by driving a long nail through the eye at the top, and a short one at the bottom, and fixing it to the wall in that way.

A hay rack may be dispensed with altogether, but those who desire to practice economy will find their object greatly facilitated by having one. When hay is supplied to a goat, the first thing she does is to poke her nose into the bundle

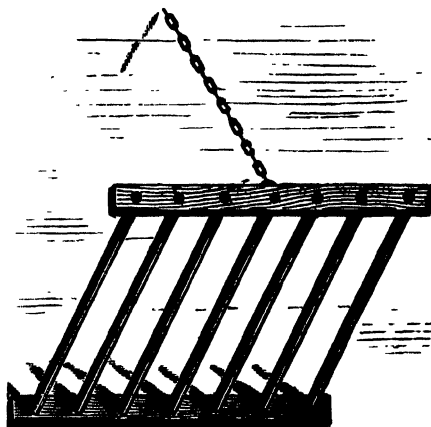


FIG. 2. HAY RACK.

and pick out the bits she most fancies, while the remainder gets trodden upon and wasted, so that as much is spoilt as eaten. By using a hay

rack, however, this evil is to a great extent avoided. The simplest kind is that commonly seen in stables ; it need not extend the whole length of the goat house, but may be fixed or merely hooked in a corner. The rack should be so placed as to compel the animal to stand on its hind legs to get at the hay.

The interior of the goat-house will not be complete without some means for lighting it at night during the operations of feeding and milking. As candles are dangerous to use where any quantity of straw is lying about, and when used in a lantern give but indifferent light, I find the best thing by far is a metal paraffin lamp fitted with a reflector, this not only gives a capital light, but also considerable heat, adding greatly to one's comfort when engaged in the goat house on a cold night. It is made to be fixed to the wall, from whence it need never be removed, thereby avoiding all danger from being carried about and upset ; besides being the best for lighting, it is the cheapest to burn ; the lamps may be bought at most oil shops and lamp sellers' in London, and cost 1s. 9d. each.

The only tools that will be required in the goat house are a stable fork and shovel ; a box to hold sifted earth in is also useful, the latter being then close at hand when required. I have often heard poultry fanciers recommend as a good plan keeping a goat in a fowl house, it being an admirable means of warming the place in winter. All I can say is, that however beneficial this may be to the fowls, it is certainly not an advantage to the goat, as not only will the manger and troughs be constantly soiled by the droppings from the fowls, but the house and goat get infested by fleas and other vermin, which will communicate themselves to the owner or attendant, much to his discomfort.

## CHAPTER III.

### FEEDING.

No animal eats a greater variety of plants than the goat, which, it is well known, will live and thrive in places where any other creature would starve. It is, however, capricious and fanciful in its appetite, often refusing one day what the next it devours with avidity, though not more hungry on the last occasion than the first. Its staple food should be grass, though it seems to prefer browsing upon hedgerows, and cropping the various brambles and weeds that abound in them, to regular grazing. Except in autumn, however, when the hedges require cutting, this luxury cannot be often supplied, as unless unlimited range is afforded, it would do considerable injury. The best place for goats to feed is on a wild common where heath and furze grow in abundance; there they will roam about, nipping off the tender shoots of the prickly furze, which they eat with a relish. In such a place they are indeed profitable to keep, as they will subsist almost entirely upon the herbs and grass which the common affords, requiring little or no other sustenance in the shape of dry food. The mischief one of these animals will do, however, in a few hours, should it find its way into any cultivated ground such as a garden or orchard, is such that, except on heaths and commons it can seldom be allowed to go loose, the amount of loss it will cause by biting off the shoots of young trees, and stripping them of their bark, or by eating the tops off vegetables, is so great that a whole year's supply of milk would not compensate for the damage done; it is therefore generally necessary when put out to graze that the goat should be "tethered."

Tethering is performed by means of a rope or chain, one end of which is fastened to a "tethering pin," and the other slipped into the spring hook already alluded to, which hangs from the collar of the goat. I must here remark that these animals being very powerful, whatever is used to secure them, either in the stable or out of doors, should be of the strongest kind. A good rope answers the purpose of a tether very well for a certain period, but as from exposure to sun and rain it is liable

after a time to rot and break, it is better, especially if the grazing ground be near a garden or cultivated place, into which, if free, the goat could gain access, to be on the safe side, and use a light iron chain. This may be procured at large ironmongers in London of any desired length at a cost of 6d. per yard. The length of the tether should be about three yards. The usual tethering pin (Fig. 3 a) is a square rod of iron 15in. long, tapering to a point, the head of which is flat and furnished with a swivel to allow the chain to turn in any direction without entangling. They can be made by any blacksmith, and cost 2s. each. When two or three tethering pins are required, they may be made at much less expense by procuring a similar rod to that described for fastening the goat in the

stable. One 4½ft. long, which may be bought for about 1s. 6d., will make three pins. The rod is easily broken into three by first filing all round the part where the fracture is required; then take each piece, and after heating to redness, bend one end in the form of a loop, as shown at Fig. 3 b, and hammer or file the other extremity to a point to facilitate its progress into the earth. The length of the pin from the loop to the point should be 12in. or 14in. This kind of tethering pin has two advantages over the previous one. In the first place, if the loop be made the exact shape of that shown in the cut,

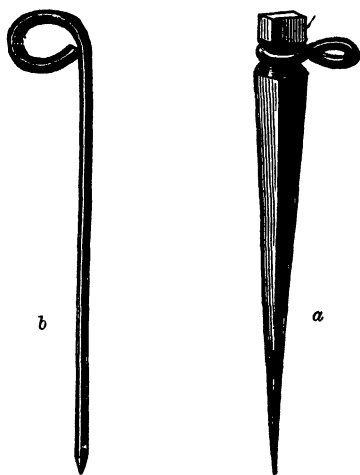


FIG. 3. TETHERING PINS.

no swivel will be needed, as the pin turns round in the hole it has formed in the ground to whatever direction the goat moves, and, in the second, it is easily forced into the earth by the pressure of the arm, whereas the square rod requires to be driven in with a mallet, which is not always at hand. The square pin is, of course, however, the stronger. It is a good plan to insert a spring hook in the loop of the pin into which any link of the chain may be caught when it is desired to shorten the range, such being often the case when a goat is tethered in a garden to eat off the haulms of peas and potatoes or the stumps of cabbages before having them dug up. On such occasions a very limited range is frequently

necessary in order that the animal may consume what is intended for it without being able to injure neighbouring vegetables or trees, the ease and efficiency with which, by the use of the spring hook, this is performed will readily recommend its adoption.

Some people, instead of tethering a goat, let it roam about at will, having previously fastened a "puzzle" round the animal's neck, which prevents its making its way through fences and palings. The puzzle, a sketch of which is given (Fig. 4), is made in the following manner: Procure three pieces of strong wood, or what is better, if obtainable, three sticks of bamboo, which combine strength and excessive lightness; these should be from 2ft. to 2ft. 6in. long according to the size of the goat, and must be fastened together in the form of a triangle, leaving the ends projecting. The horizontal piece at the bottom, which is somewhat thicker and heavier than the other two, should be secured to the latter by means of iron pins or rivets instead of being nailed, as this allows the sticks to work freely one against the other. The cross pieces at the top should be joined by a "thumb" or "fly" nut, in order to be easily parted when the apparatus is put on the animal.

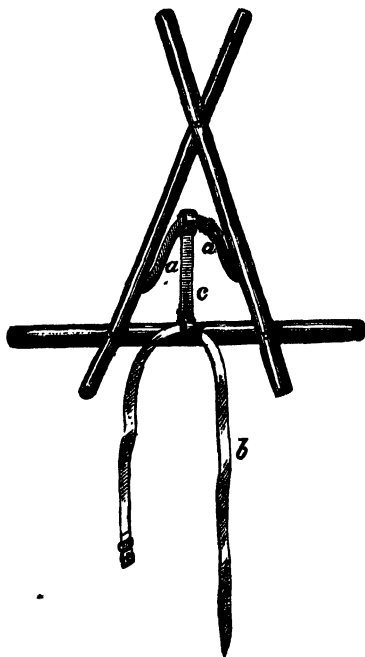


FIG. 4. THE PUZZLE.

When applied to goats having no horns, the fly-nut is unnecessary, as, if the pieces are fixed, the whole thing can be put over the creature's head. To the inside of the sticks a couple of straps must be attached which buckle over the goat's neck, their object being to support the weight of the puzzle and ensure a better fit. To prevent it from slipping on to the horns when grazing, another strap is necessary, which buckles round the body and is joined to the former by a shorter

piece of leather having a loop at each end through which both pass. Nothing answers better for this than the leather handle of an ordinary double rug strap. The arrangement will be better understood by a glance at the woodcut in which *a a* represent the two straps which go over the neck, *b* that which fits round the body, and *c* the short piece joining the two together. Besides this apparatus some people, to prevent a goat from leaping over barriers, fasten a hind and fore leg together with a cord allowing only a sufficient length for it to walk, and that with some difficulty, but not enough to enable it to jump. Although effectual for the purposes to which they are applied, I do not recommend the adoption of either of these expedients. In the first place, the animal's comfort is to a great extent sacrificed by the contrivances employed, and in the second, if we except the trouble of having to shift the position of the goat, no advantage is gained over the tethering plan, it being a fact that goats, as indeed all milch stock, thrive better and give more milk when tethered than when allowed to go free, it being of course understood that they are changed to fresh herbage as soon as that within reach gets soiled or consumed.

In spring and summer the goats should be turned out to graze as early as possible; no danger need be apprehended from their feeding off grass on which the morning dew is lying, as is the case very often with sheep, the dew having a beneficial effect rather than otherwise. If the weather be excessively hot, it is advisable during the greatest heat of the day to remove them to a shady place, if possible, where they will be sheltered from the heat of the sun. I do not mean to assert that the sun's rays would kill or even directly injure them, but as, if free, they would, like other animals, seek the shade, it is only just and reasonable that when confined to one particular spot they should have the same protection afforded them, as it conduces to their health and comfort, two essential features in dealing with all milch stock. As a rule they should be brought in at night, as soon as it grows dark, the exception being when running loose in a private meadow or inclosed piece of ground near the owner's residence, where a shed is provided as a shelter from storms. If a goat be left out all night on a common or other public place, besides the risk of being stolen, the owner may find that some kind friend has milked her for him when he next goes to perform that operation. In winter the goats may be taken out at sunrise and brought in at sunset, and should on no account be left out after that time during that season. In very wet weather, and when the snow is on the ground, it is best to keep those that require tethering shut up in the goathouse, as, not having sufficient range to enable them to keep warm by exercise, they would suffer from the wet and exposure, the change



of diet from grass to hay and leaves which they receive in the stable also having a good effect. Goats should never be tethered upon wet marshy ground where their hoofs are immersed in water and mud, as, in their natural state they frequent arid rocks and mountainous places, their feet are specially adapted for dry soils, and consequently suffer when exposed to wet for any length of time by becoming diseased.

Although grass forms the principal food of a goat, it requires besides a certain amount of extra feeding with corn and hay, the quantity depending on the time of year and the milking condition of the animal. In spring and early summer grass is in its prime, and, if the pasture be good, will support a goat entirely, unless it has lately borne kids, when it will require the assistance of corn and hay to put on flesh and get it into condition to bear the drain that is being made upon its system by the young ones. In winter and the latter part of autumn, on the contrary, grass contains but little nourishment, consequently all goats then require hand feeding, unless they have the range of a common where furze abounds, upon which during this part of the year they will principally subsist, and, with the addition of hay at night, thrive well. Every description of corn is eagerly devoured by these animals, that usually given being oats or maize—the latter they are particularly fond of. No corn should, however, be given alone, but always mixed with chaff—chopped hay and straw—and bran, the proportions being two parts chaff to one of bran and one of oats or Indian corn; a quarter of a packet of Thorley's food with each feed I have found beneficial, by increasing the supply of milk and putting on fat; when the condiment is used the mixture should be slightly damped—not actually wetted—with water, to make it adhere. As I previously stated, the quantity of this food to be given must be determined by the amount of milk supplied at the time by the individual animal; those in full milk, that have not long kidded, require plenty of nourishment, and may be allowed as much as they will eat until they have recovered, to some extent, their condition, after which the quantity may be limited to 3, or at most 4 quarts, of the mixture at a meal, reducing this to 2 quarts as the milk decreases in quantity. It is essential that no more be given at any one time than can be consumed with an appetite, otherwise much will be wasted, these creatures having a habit as soon as their hunger is appeased of "nosing" over their food, picking out the corn and leaving the rest, which, having been much breathed upon, they afterwards, unless very hungry, refuse to eat. Goats that are dry, or nearly so, do not require to be so liberally fed; potato peelings, cleaned of their dirt and chopped into small pieces may be mixed with the chaff and bran instead of oats, the latter being supplied only occasionally, and then with the potatoes

for a treat. The dry animals need be fed but once a day—at night; the others twice—morning and evening. Although I have mentioned potatoes as a substitute for oats, I do not mean to say they take the place of the corn; they should only be given when the animal is in tolerably good condition, those in a poor state requiring a more nourishing diet. Hay in a limited quantity should be supplied to all, but especially to those in milk, and should be given the last thing at night.

Regularity in the hours of feeding is an important point, and should be carefully observed. The appetite of an animal is more even, and it enjoys its food better when supplied at stated and regular intervals, than when given at different and constantly varying periods. The best time for the morning meal is an hour before taking the goats out to graze, and that of the evening immediately on their being brought in, the rations being ready for them in the mangers on their arrival. By pursuing this plan they are able, in the former case, to lie down and chew the cud quietly before being trotted out, by which time they are ready for a bite at the grass, and in the latter, it makes them look forward to coming home, which, if free, they will soon do at the same regular hour every night.

In my introductory remarks I mentioned that goats are kept by persons who have no grass whatever on which to let them feed, and yet find them profitable. I will now show how this may be done. It is a small residence, indeed, unless situated actually in London or some other large town, that has not some kind of garden in which cabbages, potatoes, and other vegetables are grown for the consumption of the family, the refuse, leaves, and peelings from which will easily keep one or two goats, according to the size of the garden, with the addition of corn and hay. The varieties of green food will, of course, depend upon the season. Potato peelings can at all times be supplied, and should, as I before mentioned, be washed of their dirt and mixed while still wet with bran; the sooner they are given after being pared the better. This makes a good meal at noon. The morning and evening meal should consist of the mixture of chaff, bran, and oats already alluded to, and, during the day, hay and any available greens from the garden, such as cabbage leaves, carrot and turnip tops, and peels. Dried leaves, horse chesnuts, and acorns gathered in autumn and preserved may also be given, and are much relished. This will be the diet for winter and spring. In summer they can have cut grass, thistles, dandelions, and such like weeds from the garden, and when the potato haulms are sufficiently grown to be no longer required for the benefit of the crop, the goats can be tethered by a short cord or chain upon them, and will feed off the green stalks with great eagerness

Besides these, the clippings of laurel hedges and the ivy on walls—in fact, everything green comes in well during that season. In autumn, again, there is no lack of forage; the leaves may then be gathered from the trees before they turn brown and fall, and make capital food, though perhaps not equal to the succulent leaves and roots of vegetables. At this time also acorns and horse chestnuts are plentiful, and if many of these trees grow in the neighbourhood, they will supply abundance of nourishing and fattening food, which is much relished by goats.

Besides dry food and forage, there are two other articles of equal importance which must never be omitted; these are water and salt. The quantity of water a goat drinks depends upon the amount of milk she is supplying and the nature of the food she consumes. One that gives two quarts a day and exists chiefly upon hay and corn, may take from two to three quarts in twenty-four hours; whereas the same animal in a dry state, and living on green and succulent vegetables or grass, will not drink as much in a week. Goats should never be allowed to suffer from thirst, and should have a pail of clean water offered them morning and night, and, if rejected, it should be left by their side for a quarter of an hour or so; as although they may refuse to drink before having had their feed of corn, they will often do so when the latter has been consumed. It is a bad plan to leave water standing in the goathouse all day, as it is liable to become tainted by absorbing the ammonia and other gases from the litter, in which state it will probably be refused, and, if imbibed, is likely to impart an unpleasant flavour to the milk.

These animals are very particular regarding the cleanliness of their food and water; potato peels or cabbage leaves, for instance, that have much dirt upon them will frequently be left untouched, whereas the same washed clean will be eagerly devoured. Water, too, that is soiled or greasy, or in which chaff or hay has fallen, will be just sniffed and turned from in apparent disgust. I have even known them go so far as to endeavour to overturn the receptacle that contains it. The drinking propensity of a goat should always be encouraged, as a great drinker is generally a good milker. Where soft water is procurable, it should be given in preference to hard; all animals like it better; even a horse—than which no creature is more particular concerning the water it drinks—will often prefer what comes from a pond, although discoloured by mud, to the clear and limpid water of a well.

Next to food and water, salt is most important for maintaining health and condition. It assists digestion, and furnishes certain necessary elements to the blood, acting also as a preventive against worms. Moreover, it incites thirst, thereby causing a greater amount of water to be

drunk, which increases the quantity of milk. Goats, like most herbivorous animals, are particularly fond of salt, and will lick it with great relish for a length of time, those in a wild state travelling long distances from their usual haunts in order to obtain it. This article should not be given occasionally, but constantly, a lump of rock salt being left at all times in the manger, so that access may be had to it whenever desired. The larger the lump the better, as small pieces often get lost or are eaten whole, in which case more is taken into the system than is actually beneficial. Goats that have not been accustomed to it may when it is first given them refuse to touch it, but by having it constantly supplied will soon learn to like it. At certain periods of the year salt is more requisite, than at others; in spring for instance, when grass is deficient in saline material, a small quantity of table salt may with advantage be mixed with the provender, unless Thorley's food be given, when it is unnecessary, that condiment having already a considerable amount of the material in its ingredients.

It is a good plan where goats are kept constantly in the stable with little or no exercise, to brush them down every morning with a stiff dandy brush, and, if the hair be very long, to now and then comb it out. Some persons may call this absurd, but when they consider that grooming is to an animal what a bath is to a human being, they must admit that the practice cannot be otherwise than beneficial. The advantages gained are indeed more than primarily might be supposed. In the first place, every domestic animal is liable to the attacks of vermin, whether fleas or lice, goats being by no means exempt; but, on the contrary, and especially when in a poor condition, they are often very much troubled with the latter pest. By the use of a hard brush, well applied every day, the dirt which collects on the surface of the skin, and which seems to breed such vermin, is removed, and having no longer a resting-place they disappear—at least, to a great extent—the object of grooming being more as a preventative than a cure. When existing in large numbers other means must be used to exterminate them. In the second place, the friction on the skin of the goat by the brush causes a quickened circulation of the blood, thus to some degree taking the place of exercise, and so promoting health. Finally, the use of the brush gives the coat a fine sleek and glossy appearance, and by reason of its extra cleanliness allows of the animal being stroked and caressed—marks of kindness to which it is very sensible—without soiling one's hands.

It will be seen from what I have said that, with no other resources than an out-house and a kitchen garden, and with less expense than the cost to feed a large dog, a goat may, if properly managed, as

I shall further explain, be kept with great profit, and will supply sufficient milk for a family ten months in the year. The system I have just described, viz., keeping a goat constantly in a stable and bringing it its food instead of allowing it to graze, is simply that which has of late years been adopted and much recommended by many for cows, and termed "soiling." It has these advantages over pasturing: it keeps the animals in better condition; after eating their food they can lie down quietly to ruminate and digest it, without being molested and teased by boys, which is often the case where goats are tethered on a common or piece of land not inclosed; this, and the advantage of never being left hungry, which is liable to occur when out grazing if their removal to a fresh piece of grass has been neglected, results in the production of a larger supply of milk; furthermore, being sheltered from cold they require less food, or more properly speaking, less food is needed to form animal heat, than when exposed to the open air. Finally, a much greater quantity and quality of manure is obtained, which would otherwise be wasted. The only disadvantage, if any, is the extra attention required in feeding, this being to some extent counterbalanced by not having to take out and bring in the animals. Besides, if there be children in the family, which is pretty sure to be the case where goats are kept, the employment of getting food for and feeding them, will be a pleasant and healthful one, and one which in young persons, I always think, should be encouraged.

I have already stated that a goat eats a greater variety of plants than any other animal. In what proportion will be seen by the following tables, the results of some experiments made in Sweden and France with the goat, sheep, bull, horse, and pig:

## EXPERIMENTS IN SWEDEN.

Of 575 Plants the	Goat Eats 449,	Refuses 126
" 528 " "	Sheep " 387,	" 141
" 494 " "	Bull " 276,	" 218
" 474 " "	Horse " 262,	" 212
" 243 " "	Pig " 72,	" 171

## EXPERIMENTS IN FRANCE.

	Goat.	Sheep.	Bull.	Horse.	Pig.
Can eat.....	547	408	311	268	86
Is very fond of .....	28	81	121	113	36
Sometimes eats.....	32	33	70	39	23
Takes in all .....	607	522	502	420	145
Refuses .....	83	133	183	235	169
Total plants examined .....	690	655	685	655	314

The results are, apparently, not alike in both cases, owing, probably, to different herbs abounding in the two countries. As in France, the

experiments appear to have been carried out in the greater detail, we may take the latter to be the more correct; there we see the goat consumes no less than eighty-five more plants than either of the other herbivorous

In feeding any kind of milch stock, however, there is this point to be considered, viz.; what description of food will produce the largest return in milk? This question has engaged the attention of several of our leading agricultural chemists and experimentalists within the last few years, and some investigations have been made on the subject with different results. From some carefully conducted experiments recently made in Germany to ascertain the influence of different foods on the quality and quantity of milk, the conclusions arrived at were that the quality of milk in so far as the relative proportions of its constituents are concerned, is in no way altered by any particular diet, but depends on the breed and peculiarities of individual animals; the quantity, however, may be affected by the nature and character of the nourishment taken. Without going into scientific details, I may just mention that every species of food, as all are aware who have any knowledge of chemistry, contains two important elements, the nitrogenous or flesh-forming, and the non-nitrogenous or heat and fat-giving principles, otherwise called carbo-hydrates. Now it is to ascertain which of these two elements has the greater influence in the production of milk that most of the experiments have been directed. In the case just referred to, the largest return of milk was furnished by a diet rich in nitrogen, the food supplied being at one time highly nitrogenous, and afterwards containing but a small proportion of the flesh-forming element. Other investigations tend to show, however, that the nature of the food consumed does not exert so very sensible an influence on the quantity and chemical composition of milk if an equal amount of nourishment be obtained from the different kinds of food. During the last half century chemistry has made such rapid strides, especially with regard to analysis, that at the present day there is scarcely an article of diet in its simple form the chemical composition of which has not been ascertained. The following are the cattle foods which contain the largest amount of nitrogen. First and foremost stand the various cakes made from linseed, rape, and cotton seed; then in their order follow lentils, beans, peas, clover-hay, bran and oats, and among the fodder plants, grass (Timothy and Meadow foxtail), tares, lucerne, red clover, and white clover. I mention these particulars in order that those who desire to experimentalise upon their goats, with a view to ascertain the relative influence of the different foods upon the produce of the milk, may be enabled to do so. I attempted it myself, but as I did not serve out the rations by accurate

weight, which, in order to obtain a satisfactory result, is absolutely necessary, I feel that I cannot place any dependence on the conclusions formed; for, although the chemical constituents of the diet may affect the supply of milk, there is no doubt that the quantity of food assimilated by the animal influences it much more. It is a general impression, I believe, with dairymen that grass and roots, in fact, green food generally, makes more milk than dry food. This I have also found to be the case in feeding goats, and I attribute the increased yield to the succulent nature of the diet; though, at the same time, I think the milk is thinner and more watery. An interesting article on this subject, entitled "Green Food or Dry Food?" appeared in the *Milk Journal* of Sept. 2nd, 1872, giving the results of a series of experiments which bear out what I have stated. From these it appears that "dry food operates in the direction of an augmented consistency of the milk," and an increase in the live weight of cattle fed upon it, while green food, on the other hand, chiefly influences the quantity yielded." The food used in the experiments were green clover in the one case against clover hay in the other, combined in both instances with oat straw.

Before concluding my remarks on "Feeding" I purpose saying a few words on some of the different articles of food most suitable for goats, and offering at the same time a little advice with regard to the purchasing of them. Persons who keep goats for the sake of their milk are not generally farmers, and will probably not have had much experience in the judging of hay and corn, the qualities and nutritive properties of which vary greatly in different samples; a few hints may, therefore, not be altogether unacceptable.

**HAY.**—This should always be supplied either in its entire state or cut up into chaff and mixed with the provender. The purpose for which it is given is to fill the stomach, which requires a certain amount of distention to enable it to perform its functions properly. To effect this with corn alone would, in the first place, be expensive, and secondly, feeding with so large a quantity of concentrated food would be injurious. In fact, hay or chaff given in conjunction with corn may be regarded in the same light in the diet of an animal as bread and vegetables combined with meat in that of man. There are two kinds of hay—meadow hay, composed mainly of grass with a few herbage plants, and clover hay, made with that plant alone. The latter is generally preferred by goats, but the former is considered best for milch stock, besides also being cheaper.

Hay is an article which varies greatly in quality, and some care and judgment should, therefore, be exercised when buying it. Reject in particular any that is musty, which may easily be recognised by the smell, as

in that state it has lost a considerable amount of its nutritive properties. Colonel Fitzwygram, in his book on "Horses and Stables," summarises his remarks on the characteristics of good hay as follows: "Cleanness, firmness, crispness, freshness, green colour, delicacy both in taste and aroma, and appearance, the presence of flowers in their natural colours, numerous varieties of grasses, and a proportion of good herbage, are the most marked characteristics of the best hay."

**OATS.**—Oats may be regarded as the staple corn for goats, being more frequently given than any other. It is moreover the cheapest of all grain, and the richest in albuminous compounds or flesh-formers. The best oats I always consider the cheapest in the end, as inferior kinds contain so much husk in proportion to kernel that but little nourishment is obtained from them; the husk of this cereal, like most others, having little or no nutritive value. In describing the characteristics of good specimens of this grain, I cannot do better than quote the remarks of the author already alluded to, he says: "Good oats are clean, hard, heavy, dry, sweet, plump, full of flour, and rattle like shot; they have a clean and almost metallic lustre. Each oat in a well-grown sample is nearly of the same size. There are but few small or imperfect grains. The hard pressure of the nail on an oat should leave little or no mark. The kernel when pressed between the teeth, should chip rather than tear. The skin should be thin; the size of the kernel will be less in proportion as the skin is thick. The colour of the oat is not very material, but white oats are generally thinner in the skin than black. Again, black oats will grow on inferior soils. Short plump oats are preferable to large long grains. Bearded oats must have an excess of husk. Oats are not necessarily bad because they are thick-skinned, or bearded; but they must contain a less amount of flour per bushel than thin-skinned oats without beards. Good oats are entirely without smell of any kind, except that of earth, in new samples. The flour should be almost tasteless, except a slight sense of milky sweetness to the palate." In purchasing oats I always choose the Scotch variety; the grains are short and plump, more resembling barley in appearance, and containing a large percentage of flour. The best weigh from 40lb. to 42lb. the bushel, whereas inferior kinds weigh only 30lb. or 32lb.

**INDIAN CORN.**—This grain contains a considerable amount of nutritive properties, the greater proportion of which go to the formation of fat. It should, therefore, when given to goats, be mixed with peas or beans. This mixture forms capital food, and may advantageously be supplied as a change from oats. Indian corn should always be given crushed.

**BEANS AND PEAS.**—Both beans and peas, as I have already stated, contain a large amount of nitrogen, and therefore make valuable food. Given



in the form of meal, beans have the character of inducing milk rich in quality. When not supplied in this shape—which by the way comes rather expensive—they should be split. They are most nutritious when about a year old.

**LINSEED AND RAPE CAKE.**—These substances, known under the general term "oil cake," stand highest in point of nutritive qualities of any class of food, and are valuable for putting flesh and fat on an animal that has lost condition. Linseed cake is very beneficial to goats after kidding, as it not only makes a quantity of rich milk, but acts medicinally by keeping open the bowels. The quantity given should be about a pound a day, and should by preference be crushed and mixed with the feed of chaff and corn. Of the two kinds of cake here mentioned, that made from linseed is the better, and consequently the dearer; both, indeed, fetching a high price.

**CONDIMENTS.**—The artificial foods known by the name of "condiments," are composed of a mixture of the most fattening and nutritious grains, combined with aromatic herbs and spices, the whole finely ground and forming a highly stimulating compound. I have already mentioned having personally tried that known as "Thorley's Food for Cattle," and have certainly found it efficacious to some extent by increasing the supply of milk. It may be as well to state, however, that, like all stimulants, it ceases to have effect if continued for an indefinite period, and should therefore only be given for a certain length of time.

## CHAPTER IV.

### MILK AND MILKING.

I now come to the principal object for which the goat is kept, that is to say, its milk. From the earliest and most remote periods goats' milk has been used as food for man, and in the Scriptures we read of it more frequently than the milk of cows. At the present day, however, it is almost a scarcity, and on account of its medicinal properties is chiefly sought after for invalids—especially consumptive persons—and young children, for which purpose it fetches a high price, as much as 6s. per quart having been paid for this valuable article, though the usual charge in London is from 2s. 6d. to 4s.

The principal virtues of goats' milk are, its great nutritiveness, its lightness on the stomach, and consequent easiness of digestion. In point of consistency it is said to be intermediate between the milk of the cow and that of the ass, and is, next to the latter, the nearest approach in its composition to human milk, on that account being frequently used, when asses' milk cannot be procured, for nourishing infants that have to be brought up by hand. Apart from its medicinal value, however, goats' milk is, for domestic purposes alone, far superior to the ordinary milk supplied by dairymen, as all who have tried it can testify. Boiled and used with coffee it is delicious, giving the latter a rich creamy appearance, whilst a few drops in a cup of tea are more than equivalent to a teaspoonful of the chalky mixture in common use. When used in cakes and puddings, its superiority is quickly apparent both to the sight and taste, imparting a rich yellow colour to these articles when cooked, and thereby acting economically by lessening the requisite number of eggs. Its only disadvantage for cooking purposes is its liability to curdle, which it is very apt to do if used rather old. It bears diluting well, and even when mixed in the proportion of "half and half," is by no means "sky blue." Nothing, indeed, can be more wholesome, more nutritious, and

cheaper (when home-supplied) for a young child's breakfast than a bowl of new goat's milk and water in which bread has been boiled to form a sop.

In fact the qualities of goats' milk only require to be better known to be properly appreciated. As it is so few have tasted this valuable article that some have almost a prejudice against it, thinking, because it comes from any other animal than the cow it must be unpalatable. I have frequently met persons who are impressed with the idea that this milk has a peculiar flavour, and it has been only after considerable persuasion that they have been induced to put it to their lips, which, by the way, they do as though they were tasting medicine out of a bottle. This impression, however, is entirely erroneous. Goats' milk, when drawn clean from an animal in health, has no flavour peculiar to itself, but resembles cows' milk, both in taste and appearance, the only difference being that it is richer and sweeter, containing as it does a larger proportion of sugar. Its chemical composition, in comparison with the milk of woman and that of the ass and cow, will be seen by the following table :

	Goat.	Cow.	Ass.	Woman.
Casein .....	4.02	4.48	1.82	1.52
Butter .....	3.32	8.13	0.11	3.55
Sugar.....	5.28	4.77	6.08	6.50
Salts .....	0.58	0.60	0.34	0.45
Total solid matter .....	13.20	12.98	8.35	12.02
Water .....	86.80	87.02	91.65	87.98
	100.00	100.00	100.00	100.00

The above table shows goats' milk to contain more solid matter than any of the other milks here quoted, hence its nutritious qualities.

Being rich in caseine or cheesy matter, it is made in Switzerland and other parts into a very palatable cheese. At Mont d'Or, in the south of France, especially, the manufacture of this article from goats' milk is carried on to a considerable extent, great attention being paid to the keeping and feed of the goats. A very good cheese is in some countries made by mixing the milk of cows and goats together, whilst the delicious Roquefort and I believe, also, Gruyère, are composed of a mixture of goats' and ewes' milk. The ancients appear to have utilised the milk of the goat for the manufacture of cheese since Homer refers to it in the following line :

" With goats'-milk cheese a flavourous taste bestows."

Iliad, Book xii.

If left to stand for twenty-four hours goats' milk throws up a quantity of rich and delicious cream, which some people use for making into butter

it is not, however, equal to that made from the milk of the cow, being generally of a pale colour, and rather soft consistence, it is said, also, to have a peculiar, though not unpleasant taste. I ought to add that, never having myself made or tasted this butter, I am unable to speak from personal experience.

Milking is not so easy an operation as at first sight may appear, and it is only properly learnt after some little practice. There are two ways in which it may be performed—the one being termed “nievling,” and the other “stripping.” The former is that generally practised by milkmen and dairymaids, and is certainly the better of the two. It is effected by firmly grasping the teats, one in each hand, and gently but rather quickly forcing them down, at the same time closing the fingers upon them, the pressure commencing with the first and terminating with the little finger. As soon as the stream thus caused to flow has ceased the grasp is slightly relaxed, and the hands sprung quickly upwards, when a fresh supply rushes from the udder, and is again squeezed out as before, the streams from each teat following so closely in succession as to sound like one continuous flow. Stripping consists in taking hold of the teat at the part nearest the udder between the fore finger and thumb, which are slid down its whole length, exerting at the same time considerable pressure, thus causing the milk to flow in a forcible stream. This process is continued until the udder is completely emptied. Of these two modes of milking nievling is, as I have remarked, the better to practise, being done with greater comfort to the animal—resembling more it is said, the action of sucking—and taking up less time. With most goats, however, it cannot well be accomplished, as, in many cases, the teats are so small as to afford no permanent grasp for the hand; in such cases, therefore, stripping must be performed. The latter operation is always resorted to at the termination of the milking to extract the last drops, it being easier and more effective for that purpose than nievling. Many persons also commence with it, and continue until the milk flows freely, when the other process is proceeded with. But milking cannot well be learnt from any written instructions. I would therefore advise the novice to get his milkman to come once or twice a day for a week or ten days, which he will be willing to do for a trifle, and watch him perform the operation, so that he may see how it is done, proceeding afterwards with it himself under the man’s supervision until he has so far mastered the art as to be able to milk “clean,” as it is termed—i.e., draw every drop from the udder. He must not be disheartened if at first the milk comes very slowly and only after great exertion on his part; this difficulty will soon disappear as the goat gets more accustomed to him. He should practise on a tame, quiet animal,

with a gentle disposition, as some are very troublesome with strangers, holding back their milk for a considerable time, and then only giving it in a fine thread-like stream, which takes a long while to complete the process. Goats with good-sized teats are more easy to milk than those with small ones, and should, therefore, if possible, be procured to learn on. Two important points are to be borne in mind in milking—viz., to milk quickly and to milk clean. The former is necessary for two reasons; in the first the milk is said to be better for being rapidly drawn, and in the second a goat will often get impatient when the operation is performed lazily, and will suddenly kick up her hind legs and overturn the pail. The importance of milking clean cannot be over estimated, as neglecting it results in the animal soon going dry.

Many a beginner will rise from his task under the impression that he has obtained all, when an experienced hand will afterwards, to his surprise, draw perhaps another quarter of a pint. A very good plan to adopt is to imitate with the hand the action of calves and kids when sucking by sharply pushing up the udder with the closed fist, the teat being at the same time retained in the grasp. It is surprising the effect this has in inducing a fresh flow. The reason why it is so necessary to get at each milking every drop of liquid that the udder contains is that when any is left behind it is absorbed back into the system, serving to indicate that a proportionately less amount is required during the following interval, the consequence being that the animal gradually goes dry.

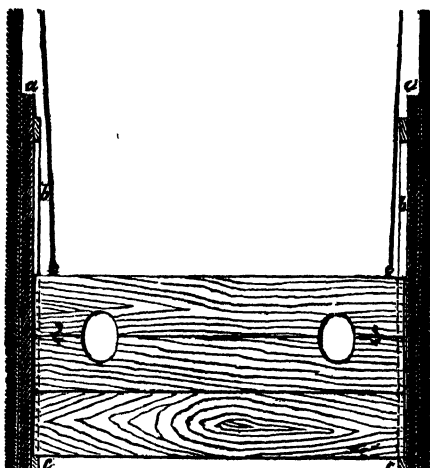
Clean milking, in a literal sense, is another matter of importance, at least in my opinion. Who has not noticed with disgust the milking of cows on a dairy farm, where the milkman goes to work with hands begrimed with dirt, on which to facilitate the process he first expectorates, and as the liquid flows squirts a few drops into his hands or dips them into the pail? Whichever he does the result is generally the same at the termination, when the last drops that are stripped from the udder combine with the black on the fingers, forming a muddy compound, which, when the pail is emptied, leaves a sediment of dirt at the bottom. I do not, however, mean to insult my readers by supposing they would milk their goats in this fashion with dirty hands; it is to the teats I wish to draw their attention. These, when the animal has been lying all night on soiled litter, or during the day on muddy ground, are sure to be more or less dirty, and, if not attended to, the result must be very much the same as in the case just alluded to; it is therefore advisable previous to each milking to go over the teats with a wet cloth or sponge of warm water until clean, and finish by wiping them with a dry cloth. The milk flows much easier after this ablution, and no fear need then be appre-

hended of grit showing itself in the pail. Indeed, in the morning I go even further, and add a small quantity of Condyl's Fluid, which thoroughly purifies the teats from any unpleasant smell that the water alone is unable to remove. This may appear over scrupulous on my part, but the rapidity with which the fluid changes colour shows that its presence is by no means unnecessary. When teats and hands are clean, a few drops of milk may be advantageously squeezed into the palms, and no unpleasant consequences ensue; it acts as a lubricant, and makes the operation easier not only for the milker, but the milked. With regard to position, I think the best way is to sit down on the floor—a stool raises the operator too high—whilst kneeling, which some persons do, renders the process very irksome and fatiguing, especially with goats that are small and hard to milk. In some countries they are milked from behind, like ewes, the udder being drawn through the hind legs and held there with one hand while the other hand draws the milk. This way is easier with some goats than the side plan; but, as a rule, whichever position the creature has been accustomed to should be continued, as they will often not stand quiet in any other, even if the change be only from the off to the near side.

Regularity in the hours of milking is a point of great importance, if an even and constant supply be desired. Indeed, with the exception of quantity of food, nothing influences the amount of milk more than this. A delay of a couple of hours, which may cause an extra quarter of a pint to be drawn, will show its effect in the milkpail during the following interval by half a pint less, whilst an alteration of three or four hours may affect the supply for days after. Goats should for the three first months after kidding, or as long as they are in full profit, be milked three times a day, at six or seven o'clock in the morning, one or two in the afternoon, and eight or nine at night. Afterwards two milkings daily, about seven a.m., and seven or eight p.m. will be sufficient. This should be kept on until only a pint is given in the twenty-four hours, which need only be drawn once a day—every morning. I believe three milkings daily is not recommended with cows, but with goats it is different, the udder of these animals possessing a less power of expansion than that of the former, the consequence being that when the bag is full milk ceases to be secreted, but the secretion recommences as soon as some has been drawn; hence a greater quantity may be obtained by three "meals," as it is called, than by two daily. This is a fact, I believe, not generally known, for most persons milk their goats but twice, no matter in what stage they may be. This may at the same time be accounted for to some extent by the fact that those who look after their animals themselves are engaged in

business during the day, and have only the morning and evening to devote to them.

It is a good plan to feed and milk at the same time, as it serves two purposes—if the goats are milked regularly they get fed regularly, and also stand quieter during the operation when their attention is engaged on their food. Some are, however, a great trouble to milk, especially at first, as I have before remarked, indeed I have one that was quite six months before she would stand quietly. I tried various modes of tying her up, but to no avail; if she could go neither forward nor backward she would manage to rear up on her hind legs and then lie down altogether, rendering milking simply impossible. I accordingly devised an



MILKING STOCKS.

apparatus which has succeeded so well that I give it here for the benefit of my readers who may be in a similar difficulty. It is as follows: At the head of the stable, in front of the manger, I fastened on each side of the wall a batten (a a) 5ft. long, on which I nailed two pieces of wood (b b) to form guides or grooves. In these guides are run three boards 9in. wide and 1in. thick, the lowest being within 3in. of the floor, and supported in its place by means of pieces of wood (c c) nailed horizontally across the bottom. The object of this space is merely to be able to rake from under the feeding box any waste food or refuse that may have fallen and accumulated there. Two similar pieces are nailed at the upper extremity

of the guides to prevent the top board from sliding out. The guides are left open in the drawing, that is to say, only one is shown on each side to allow the working of the board to be better seen. At the top of the middle plank, and 10in. from each end, a piece is cut, or rather sawn out, leaving a semi-oval opening, the one above having at the bottom a corresponding piece removed, so that when the edges meet an oval hole is formed, measuring 7in. from top to bottom, and 6in. across. The object of this, as may be readily guessed, is to hold the animal's neck, it being easily effected by sliding up the top board, and, as soon as the head is inserted over the lower one, to let it drop, securing the two boards together with a couple of hooks and eyes. The upper plank is arranged by means of two weights and some sash line run on pulleys to slide up and down like a window without any trouble or exertion. The dimensions I have given of the holes and their distance from the ground are in accordance with the sizes of my goats' necks and their heights. They may, therefore, be made larger or smaller to accommodate the animals for which the apparatus is intended. I find it advantageous, having several goats, to keep one stable fitted with these "stocks," it being particularly useful with young "nannies" that are milked for the first time, the only objection being that after they get accustomed to them they will often not stand quiet unless they are used.

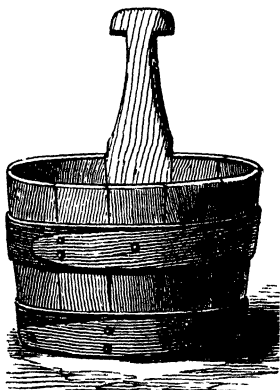
It must not be supposed that all goats are the same trouble to milk as the one I described just now. On the contrary, as a general rule they are quiet and tractable, submitting to the operation with apparent pleasure. Nor is this to be surprised at, considering the hard and distended state of the udder of a good goat previous to its being milked, and the symptoms of uneasiness the animal exhibits when the hour for doing so has been delayed. When the milk is drawn for the first or second time after kidding, goats are apt to be rather fidgetty, but this will soon be got over with kindness and patience. And here let me remark that patience and an even temper are two most essential qualities for anyone to possess who has much to do with milch stock. It is said that cows will give more milk to a gentle kind tempered milkmaid than to one with rough and impatient manners, and consequently prefer to be milked by a woman. However troublesome and unsteady your goats may be, keep your temper as much as possible, patting and coaxing rather than punishing by blows, for much of the latter treatment is not unlikely to result in an empty pail with the subsequent effect of the animal going dry altogether. I have certainly in one instance found a sharp stroke with a switch the only effectual cure for a habit contracted by a goat of my own, which persisted in lying down as soon as her teats were touched, well knowing, as she did, with a cunning



worthy a better object, that in such a position it was quite impossible to draw a drop from her. Measures of violence, however, should only be resorted to when other and more gentle treatment has quite failed.

When goat's milk is used for feeding an infant that is being brought up by hand, let me caution the parents to see that it be drawn always from the same animal, as if only a quarter of a pint from another goat be given to a very young child, it is sure to derange its digestive organs. This advice may, perhaps, be said to appertain more to the family doctor than to myself. I think the information of sufficient importance, however, to warrant my giving it, in case the fact be ignored by some of my readers. And here is apparent another advantage that persons with their own goats possess over those dependent on the milkman for their infant's nourishment. Every mother who has tried knows the difficulty she has in obtaining milk drawn always from the same cow, or at least relying on its being such. How far better, then, to be independent, and have your supply from your own stock, in the shape of a couple of goats, which you either milk yourself or see done under your own eye.

A few necessary utensils will be required for use in the "goat dairy." They are a milk pail, a strainer, a cream skimmer, and shallow pans for containing the milk when set for cream. In milking, some persons use a round wooden bowl instead of a pail; I have tried both, and much prefer the latter, it being less easily overturned should the goat accidentally place her hoof upon its edge; and, moreover, having a flat bottom, the milk as it first descends from the teats does not run up the sides and get lost, as is frequently the case with the round bottomed article. I append a sketch of the proper sort of pail to use. It should be made of well-seasoned wood, the staves fitting closely together and bound with two good strong wooden hoops. Its height is 6in. and diameter 8in., holding about half a gallon. One of these dimensions is not easily procured, as those generally kept are intended for cows, and therefore too large for the smaller animal we have to do with. The only shop in London I know of where milk pails the size I have named are made is at Walden's, in Shoe-lane, Fleet-street; they cost 3s. each. After the milk is drawn, it should be



MILK PAIL.

strained through a fine hair sieve, or, better still, through one with silver wire instead of hair. The object of straining is not so much to get rid of grit, which as I have shown ought not to be present, as to retain in the sieve the hairs from the udder, which in some seasons come off in large quantities.

As soon as strained, if cream be desired, the milk should be poured into shallow pans, and set aside in the coolest possible place for the cream to rise, which it does more rapidly and thoroughly in such vessels than in deep ones. When once set the milk should not again be disturbed until it has been skimmed. In summer it may stand from eighteen to twenty-four hours, according to the state of the weather, in winter twenty-four or thirty-six. In the former season it may be skimmed twice, and is even then richer in appearance than the sky-blue fluid which is sold at our doors. Dishes or pans for setting milk in are made of glass, wood, porcelain, or stoneware. The latter kind, that termed iron-stone, I always use, it being cheap and easily cleaned. Glass and porcelain have this last quality also, but are more expensive; whilst wooden utensils, although less fragile, are liable to smell sour if not kept very clean and frequently washed with soda and silver sand. Wherever the milk be kept, care should be taken that no strong-smelling articles, such as cheese or meat, be placed near it, as the fatty particles it contains rapidly absorb any odour with which they come in contact, giving the milk an unpleasant flavour.

Every utensil should be scalded with boiling water as soon as used, and afterwards put out to dry and purify in the open air. An occasional soaking in soda and water is further beneficial. In very dry weather a little water should be left in the milk pail, as the staves are very apt to shrink from the heat, causing it to leak when next used.

I will conclude the subject of milking by remarking on the quantity and quality of milk obtained from different goats. The usual quantity given when in full profit is from two to three pints a day, the latter being considered a very fair supply. Occasionally two quarts are obtainable, this being generally the measure which sellers inform you is given by the goat they have for sale. Such a statement should always, however, be taken *cum grano salis*, as but few animals give so much, and the buyer in these cases may think himself fortunate if he gets three pints out of his purchase. A very good milker will sometimes give five pints daily, but such animals are rare. The greatest quantity I have ever known to be supplied in one day is three quarts, and that is from an English goat now in my possession, this extraordinary yield having been given for a considerable period. With one exception, I have never seen it equalled, though I recollect reading that as much as four quarts have been known to

be milked from a goat every day. Such a valuable specimen, I regret to say, it has never been my fortune to encounter, and I think it may rank among "the sort of thing one reads about but very seldom sees," as the song says.

The flow of milk decreases as the period from kidding advances, continuing at its height for the first three or four months, and then falling off to the extent of half a pint. A similar decrease takes place in another three months or thereabouts, the amount then given being continued until the goat is again pregnant, when she generally begins to go dry. Some specimens, as is the case with one I have, continue milking up to the time of parturition; but this should not be allowed, as such a constant drain upon the system is not only injurious to the mother, but also to the young which she carries, and likely to lessen her future supply.

Goats differ also in the quality of their produce, some yielding much richer milk than others. I cannot say I have found any particular variety predominate in this respect, the richest milker I ever had being a cross between the English and Swiss breed. The amount of cream skimmed from the milk of this animal has been truly astonishing.

The quality of milk varies also with the season, and according to the length of time from kidding, being richer when the goat has shortly kidded than when she is going dry. At each milking, even, it is not of the same consistence throughout, those portions which are first drawn from the udder being less rich than the last drops, commonly called the "strippings," which are nearly all cream. If these be put to stand in a separate vessel the difference in quality will be readily seen. Where several goats are kept it is a good plan to milk all the strippings into another pail, using them in tea and coffee, and keeping the other portions for cooking purposes. The reason given why the "strippings" or "afterings" are so much richer than the previously drawn portions is that the fatty particles rise to the top of the milk as it stands in the udder in the same way as when afterwards placed in open vessels, and as the lower part comes out first it follows that the greatest amount of cream only makes its appearance at the termination; hence the advantage of drawing every drop that the udder contains.

## CHAPTER V.

### BREEDING.

GOATS in a wild or half-domesticated state breed but once a year. They pair between October and December, and bring forth their young about March or May, the period of gestation being five months. Domestication, however, shows its effect in this as in many other instances, and a goat that is well housed and fed will sometimes breed twice and at any month in the year. The best time for pairing is from September to November ; by choosing these months the kids will make their appearance from February to April, so that by the time they are weaned the new grass has commenced springing up, and affords a tender bite for their young teeth. The earlier in the year they come into the world with this condition the better, as they have then all the spring and summer, when feed is best and most abundant, for their growth and development. A goat may come in season at any time from six weeks after parturition to six months, and until conception has taken place will continue doing so at intervals of from one to six months, according to the time of year. The period of the sexes is indicated by a falling off in the appetite and consequent decrease in the flow of milk, great uneasiness, continual bleating, and a frequent shaking of the tail. This condition continues from twenty-four hours to three days, and may not reappear for some months. Although the best season for breeding is in the early part of spring, where several goats are kept for their milk, it would not be advantageous to have them all in full profit at the same time, as during the summer a larger supply of milk would be given than probably required ; whilst in winter the animals would be going dry. In such cases they should be arranged to kid alternately ; for instance, when three is the stock in hand, one should breed in April, another in August, and the third in December, or two in the summer, when milk and cream are most required, and one in the winter.

A she goat will commence breeding at eight months, but as I have

before stated, if good stock be desired, it should not be permitted at so early an age, as the animal's growth is by no means completed, and its frame not properly developed; the consequence of too early breeding is that the mother is stunted in size, and the kids weak and diminutive specimens. The yield of milk also when so young is very small, sometimes being hardly worth the trouble of drawing. The earliest age at which it should be allowed to breed is two years, that is to say, one that is born in the spring may breed during the autumn of the following year. From that time to the age of seven they bear their best kids, although some may be fruitful much longer. Their natural term of life is about twelve years, but I have read of one living to eighteen, and giving a pint of milk a day even at that age.

The number of kids a goat brings forth at a birth varies from one to four. It usually happens that they have twins, two being more frequently produced than either one or three. Four at a birth is quite the exception and very rarely heard of, though I have seen one that gave this number on three successive occasions. It is not to be desired however, as so many cannot be properly reared at a time by one goat, unless it be a very extraordinary milker, three, indeed, being more than some can manage to suckle. I have noticed as a singular fact, that whatever be the number produced on the first or second occasion, the same will often be continued in subsequent litters; and not only this, but that the peculiarity descends from mother to daughter. A goat of my own, which has always three every time she kids, inherits this property from her parent, which did the same before her.

As I remarked in a former chapter, a goat may have all the appearance of being in young and yet be nothing of the kind. The fact may, however, be ascertained at six or eight weeks before the time of reckoning arrives, by pressing the fingers against the animal's flanks, when a hard lump may be detected, which is the head of the kid; when it is felt, no doubt need be entertained of the result.

Throughout the period of pregnancy a goat should be liberally fed, but as the time for parturition draws near, that is within a fortnight of the day on which the kids are expected, care must be taken that the animal is not fat, as high condition at this time is liable to produce inflammation at the birth, which may terminate fatally. To avoid this the rations should be reduced in quantity, and only those of a laxative nature supplied; such as potatoes or turnips, and bran slightly moistened with water. A feed of oilcake may be advantageously given every morning, as it has also a tendency to keep open the bowels. There is this advantage, however, in goats, they get through their confinement, as a rule, very easily, and, in nine cases out of ten, without accident; such a thing as a death occurring

at the event, even when the young are born dead, being quite the exception. It is surprising the amount of butts and blows which these animals are capable of receiving while pregnant without experiencing any ill effects. It would almost seem as though nature had especially provided against all such casualties. It is, nevertheless, advisable to take extra care of a goat when in kid. They should be driven, or led gently, and not allowed to run, as much exertion will cause some to pant for hours after. Those that live on a common are generally more hardy than such as are kept constantly in a stable. The former will often drop their kids under a furze bush, and after licking them over, partly cover them with ferns and go on browsing, returning at intervals to suckle and lick them again. Here they live and thrive, though left out for weeks, both night and day, and in all weathers. One that has been more delicately reared, however, requires more careful treatment. As the day of its expected accouchement draws near, a separate place should, if possible, be prepared for the mother, where she may move about at will, as it is important that she be not fastened in any way. Signs of approaching parturition are shown by the goat becoming restless, and lying first in one place and then another, frequently changing positions; she also bleats a great deal, and her udder enlarges and becomes filled with milk. When this is noticed she should not be taken out to graze, but kept in the stable, where a good bed of fresh straw, a bucket of clean water, tepid, and a lump of salt with plenty of sweet hay should be provided for her. While giving birth to the kids she is best left to herself, as these animals rarely require any assistance. As soon as it is over, which may not be the case, if there be several, for an hour or more (thirty or forty minutes elapsing in some instances between the birth of each), the mother should have a bran mash given her, and a drink of water, in which a dash of warm has been added. The mash is made by pouring boiling water over a quart or so of bran until thoroughly moist without being sloppy. It is necessary that the water actually boils, in order to extract the full nutriment from the bran. The first act of the newly born kids upon gaining their legs, which they do, if healthy and strong, almost as soon as they are into the world, is to make for their mother's teats. These they are sometimes slow to find; but that is of no consequence, as they do not actually require nourishment for several hours. If the udder be full of milk, however, a portion should be drawn away, as the great weight and pressure will cause the mother pain. At the expiration of ten or twelve hours, should the kids be still unable to draw any milk, the teats of the goat must be examined to see if they be plugged up, in which case they should be fomented with warm water, and the liquid gently drawn. As soon as it comes freely, the kids should be again put to the mother, and

if they do not then suck properly, the teats must be placed in their mouths; once they have drawn a few drops, they rapidly improve the occasion, and do not often require a second lesson.

For the first three days the milk that comes from the udder has a yellow appearance, and is of a thick consistence; in this state it is called biesting, and is said to be highly nourishing, containing, as it does, nearly three times more casein than at a subsequent period. During these three or four days, the milk is scarcely fit for food, except to the kids, upon which it acts medicinally as an aperient. It soon assumes its ordinary character, however, which may be known to be the case when it froths up on being drawn.

If the weather be very cold and wet for the first few days after the birth of the kids, it is better to keep them shut up with their dam in the goat-house, unless there be some warm well-sheltered corner in the paddock where they may take refuge. But should the days be fine and dry, especially in spring and summer, the sooner they are all put out the better, as they grow hardy by early exposure. With very good milkers it sometimes happens that the kids, if only two in number, do not take all the milk that the mother yields; in such a case it is advisable, in order to keep up the supply, to draw off a portion daily, taking care, however, as the young ones grow older and require more nourishment, to discontinue doing so. I have known instances, also, where the goat having unusually large teats, the kids take a fancy to one only, leaving the other untouched. The result is, that the neglected teat gets very distended, and if allowed to continue in such a state, becomes corded by the milk clotting inside, and is rendered useless for ever after. The simple prevention of such an issue is to milk the teat regularly night and morning until the kids take to it, which they generally do after it has been emptied and reduced to its natural size.

At six weeks old is the time to commence weaning the young goats. To effect this they should be separated from their mother during the day and put to feed where they will find plenty of young and tender grass and herbs. They will eat such food very readily at this age, as they begin to make use of their teeth when only a fortnight old, and sometimes even earlier. If the separation can be made to take place at a distance from the owner's residence he will find it beneficial, for his own sake, as the frightful noise these youngsters and their fond parent set up when they discover themselves parted, is enough to make a nervous and impetuous individual put an end to the existence of the lot in the most summary manner possible. When separated at a sufficient distance to prevent their hearing each other's cries, however, they soon get accustomed to their

position, especially if they have plenty of food to occupy their attention. Before being brought together again at night the goat may be relieved of the greater portion of her milk, allowing the remainder to be taken by the kids, which, at the end of two months, may be weaned altogether. If the milk be much needed, the weaning may be commenced and concluded a fortnight earlier, but the kids cannot be expected to be so fine and strong in consequence. If large and healthy stock be the point aimed at, they may be allowed a week or two more at the udder, and be afterwards supplied, not only with grass and herbs during the day, but a feed of chaff and corn at night, both being of the best description. They should be early accustomed to be handled, particularly the "nannies," which are intended to be kept for future milk stock, as it makes them docile, tame, and tractable, adding considerably to their value thereby.

Although, as previously remarked, parturition with these animals seldom terminates fatally, it may afterwards happen that in consequence of there being more young ones than the goat has milk for, the drain upon her system is so great that she falls ill, losing her appetite and the greater portion of her milk. When such is the case, the kids must be at once taken from her, and, for a time at all events, if not altogether, brought up by hand. This is a matter of no little trouble—I do not mean difficult to perform, but taking up much time and patience, as each must, of course, be fed separately. I would, therefore, advise that any over two be at once killed and brought to table, being at that age a most delicate morsel. I have tried several ways of feeding the kids, and have at last adopted the following as being the most expeditious and giving the least amount of trouble, it having, moreover, the advantage of most closely resembling the natural mode of sucking. I procured a good sized glass funnel, over the end of which I slipped a piece of thin indiarubber tubing, about a foot long, fixing at the other extremity an ordinary indiarubber teat. I placed the funnel in one of the rings of a large iron retort stand I had by me, which proved particularly useful, not only for keeping the funnel perpendicular, but by allowing it to be raised or lowered, to suit the height of the kid, simply by sliding the ring sockets up or down the rod. The teat being placed in the mouth of the little animal, it easily sucked the milk from the funnel, which was kept replenished from a jug. The objection to hand feeding in this manner is that the kid, by drinking fast, is apt to swallow more food than its digesting stomach can receive, so that it passes into the rumen, causing disease. To obviate this, the young ones should be fed frequently, and with a limited allowance only each time. With regard to the kind of food nothing equals, of course, their natural nourishment, goat's milk, but when that cannot be afforded then cow's milk must



be supplied. From the quantity the kids will consume, however, as they increase in size, this will be found to come expensive, and it will be, therefore, advisable to mix it with water in the proportion of half and half, compensating for the dilution by adding a small quantity of farinaceous food to thicken it, and make it more nourishing. Oatmeal, pea meal, or linseed may be used for this purpose. Oatmeal having a relaxing effect, however, cannot long be continued, and therefore one of the others must be resorted to. Linseed requires to be boiled in water until it forms a jelly on cooling; but the pea meal need only have hot water poured on it, stirring the mixture well to prevent lumps forming, and leaving it afterwards to get cold, when it becomes gelatinous. A small proportion of either of these articles may be mixed with the warm milk and water, and makes capital food. Care must be taken that the liquid be not too thick, or it will not pass freely through the tubing. It should be given as near as possible at the temperature of new milk. The mother in the meantime should have plenty of the best and most nutritious food provided her, and everything done to restore her appetite, and bring back her milk. At such a time a free supply of salt with some of Thorley's condiment mixed with her corn twice a day will be found to do great things. If she comes round in a few days, and the kids are still in their infancy, so to speak, the latter—minus one, may be restored to her; but if by the time the goat gets well the young ones are approaching the usual age of weaning, they had better be kept apart from her entirely, when she must be milked in the usual way.

"Like produces like," is the motto to be observed in breeding. To get good stock, therefore, large animals must be selected, and they should match as near as possible in outward appearance and inward qualities, both descending from good milking families, this characteristic being generally inherited. Beside size, the male should have good form, his neck being short and thick, head small and well set on, with tapering muzzle, pendulous ears, a full and bright eye, and a long flowing beard. His body should be well furnished with hair of a fine quality, and tolerably long without being shaggy. It is necessary that he be in perfect health, and between three and six years old. The points of the female are much the same as those of the male, and were described fully in the chapter on the varieties and selection of goats (Chap. I.). With her the udder is the chief feature as affording the best indication of good milking capabilities. Its size should be marked not so much in length as in breadth, that is, instead of forming a long narrow bag, it should be wide and capacious, filling up the space between the thighs. The frontispiece, representing an English nanny in my possession, herself a very good milker, shows many

of the points to be aimed at. The udder of this animal is particularly large and well formed, and her teats long and easy to handle.

It is important, to insure success, that neither the male nor female be too fat, especially the latter, as in that state she is often apt to prove unfruitful, and cause disappointment. This not unfrequently happens with goats that are kept constantly in stables, where they have abundance to eat and no exercise whatever. I have noticed that a plentiful yielder of milk is more prone to fatten than others. I do not mean that a large secretion of milk results in a goat getting fat, the reverse being far more likely, but that an animal which fattens on but little food usually proves a good milker; and I account for it by the supposition that if only a small proportion of nourishment be required for the formation of fat and to keep up the strength and condition of the goat, all the rest that is consumed must naturally go to make milk.

## CHAPTER VI.

### HE-GOATS.

WITH the exception of a few remarks, I have up to the present written only of the she-goat, I will, therefore, now say a few words about the male of this species, vulgarly known as the "billy." If the former be but seldom kept, the latter is still less so, many persons objecting to these animals on account of the strong and unpleasant scent which nearly always accompanies them. This peculiar odour, which emanates from the skin, begins to be noticeable about the age of puberty, and increases as the goat grows old, being always much more powerful at the rutting season than at any other time of the year. The scent may then in an old goat be distinguished half a mile distant, and a person touching the creature with his hands or clothes will find the smell hang about him all day. Although unpleasant to the olfactory nerves, it is by no means unhealthy, but rather the reverse, especially with horses, on which it is supposed to act as a preventive against the staggers. For this reason he-goats are mostly kept by innkeepers and persons having large stables. If emasculated when young, they will be as free from the scent afterwards as the she-goat, which, strange to say, has not this objection, or, in some cases only in a very slight degree. He-goats will breed at from nine to twelve months old; but to get good stock they should not be used until they have reached the age of two years, and they are generally unfit for stock purposes after seven years.

All he goats that are not intended to be kept for future stock should when four months old be castrated. They may then at any time be killed and eaten, and have not the strong unpleasant flavour which those not having undergone that operation possess when over a year old. The animal should have fasted for twelve hours before, and should afterwards be kept quiet in a dry place; in a day or so it will have regained its spirits, and in a week be perfectly well. The only domestic use to which

"billies" are put in this country, and in many places on the Continent, is as beasts of burden to draw children in little carriages, in which capacity when prettily harnessed, they have a very pleasing appearance. It is generally at the seaside resorts during the summer season that these little vehicles are encountered, containing their juvenile occupants, whose faces beam with delight at the idea of driving themselves. I know instances where goats have been used for this purpose by persons of riper years. Not very long ago a gentleman in the United States kept two very large white "billies" which he used to drive about in a handsomely got up chaise, often travelling in this way at no less a speed than ten miles an hour. These animals may easily be taught to draw, and will learn to obey the voice and rein as well as ponies. Their education should, however, be commenced at an early age, in order to get them thoroughly under control.

The two principal requisites in training a goat to draw—as, indeed, in teaching any animal, no matter to what purpose—are patience and kindness. These creatures are capricious in the extreme, at times appearing to refuse to perform what is required of them, through pure whimsicality, which is better got over by kindness and coaxing than by any application of the whip, as the latter only frightens and makes them less tractable afterwards. The trainer must begin by making his goat lead well, putting a bit in its mouth, and the harness on its back, but not attaching it to any vehicle. This is, perhaps, the most troublesome and difficult part of the undertaking, as the animal does not at first quite understand what is required of him, and moves in any direction but the one in which he is required to go. The difficulty is overcome by practice, however, and the lesson should be gone through twice daily for an hour at a time. When the goat has acquired tolerably well the habit of leading straight, and turning to right or left by the guide of the rein, he may be harnessed to the carriage, which should not at first be too heavy, and, of course, have no occupants, the trainer beginning by leading him about, and subsequently driving him with the reins, himself walking beside or behind the vehicle. It is a good plan, where a large open space is available, to accustom the animal to the carriage and harness and to move freely by letting it go at will with the bit on and its head reined up; this also gives it a better mouth for driving. If a goat be exercised only once a day, it should be done in the morning before it has eaten any grass, or been only lightly fed on chaff and corn, for some of these animals get so "blown" with green food that it is almost impossible to buckle the straps round them. They also go better on a half empty stomach than a very full one, besides which, if worked in the latter state, it spoils their wind. Domestic

goats are not long-winded at the best of times, and should, consequently, not be driven fast until in good working condition, and even then, not for any length of time.

The harness should consist, besides the reins, of a bridle with bit, a breast strap, a pad or saddle, with crupper, belly strap, and shaft-tug to support the shafts. Blinkers are not necessary, though when used they improve the appearance of the little turn out, as does also a nice saddle-cloth under the pad. A small collar may be used in lieu of a breast strap, and looks more finished, but the former is easier and quicker to put on, besides being less expensive. A set of harness costs from 10s. or 15s. to £2 or £3, according to the amount and quality of the trappings. A good four-wheeled goat carriage may be had for about £5.

## CHAPTER VII.

### OTHER UTILITIES OF THE GOAT.

THE flesh of the goat is not commonly used in England as a food, though why kids at least should be so rarely seen on our tables can only be explained by the same reason that the milk is so little used, viz.—that its qualities are unknown. Those who have once tasted goat's flesh and got over the prejudice which many silly persons have against any kind of food not in common use, would, I feel sure, be unlikely to refuse it on a subsequent occasion. The meat of a young she-goat or emasculated male is sweet and fat, although rather hard and indigestible in comparison with beef and mutton; that of a well-fed kid, however, is as nourishing and tender as the best lamb, and far more delicately flavoured. It is but right to state that the flavour varies with different specimens, just as the milk varies in richness. I always find the flesh of a goat or kid that gets its living on a common or on downs more finely flavoured than that of house-fed animals, for the same reason, I presume that the superiority in taste of mountain mutton over other kinds is said to be due to the aromatic herbs, such as wild thyme and marjoram, with which such places abound, and which form part of the food of the sheep that live there.

Everyone knows how often the kid is mentioned as a delicacy in the Old Testament. With the Hebrews and Greeks it ranked among their most dainty dishes. The meat may be cooked in exactly the same way as lamb, which latter it so closely resembles, especially when accompanied by mint sauce, as to be easily mistaken for it. If left to hang for an extra length of time, and eaten with currant jelly, it is very like venison, more particularly when the kid is about six months old. These animals are best, that is attest and most delicate, when killed before they have left off sucking, when they should be cooked and brought to table whole. For the benefit of any epicurean reader I will here give a recipe for dressing a kid to

resemble fawn, which was given in the *Magazine of Domestic Economy* (1838). It is certainly a most elaborate affair, and rather too costly and troublesome for those who only keep "plain" cooks:—

"To dress a kid to imitate fawn: Rub the whole surface inside and out with salad oil, then put it into a pan with a bottle of port wine, a pint of vinegar, 2oz. of salt, and 2oz. of treacle. Turn and baste it every day during five days. Take it out and wipe it dry and hang it up for twenty-four hours, then stuff it with the same force meat as hare, and roast it in the following manner: Rub over it a quantity of clarified butter, and sprinkle with salt; then lay large rashers of fat bacon all over the back; cover the whole with clean letter paper and tie it on with pack thread. Baste it continually; when more than half done remove the paper and bacon, dredge it with flour, and baste it again until it is done; and ten minutes before taking it up sprinkle some salt over it. It should be served with the following sauce: Chop a few mushrooms, shalots, parsley, a small bit of bay leaf, and the least bit of thyme. Put these into a stew pan with a lump of butter. Let them fry for a minute or two, then add three spoonfuls of brown gravy. When this has simmered gently during a quarter of an hour, dredge in flour enough to absorb the water, and stir it for a few minutes over the fire. Then add a pint of good broth continuing to stir it until it is boiled well together. On taking it off the fire shake in a teaspoonful of pounded loaf sugar, and pepper and salt to taste, and squeeze in the juice of half a Seville orange."

Long as it is, I have given the above recipe *in extenso*, for although it might certainly be considerably modified, I feel, not being a cook myself, I might in my ignorance leave out the very part that is most important. I have never been able to summon sufficient courage to ask my own kitchen superintendent to dress me a kid in the above fashion, and therefore cannot vouch for the result on the palate. I cannot help thinking, however, that any eatable, or even uneatable, animal would make a delicious dish when treated in such a way.

The best way to kill a goat or kid is to take a long pointed knife and thrust it into the neck just behind the jawbone, the incision should be larger on the side where the knife comes out than where it goes in, in order that the blood may flow freely without spurting out. In this manner life becomes extinct in a very short space of time. The animal should have fasted for twenty-four hours previous to being slaughtered in order to clear the intestines.

I have mentioned the milk and flesh of the goat as its chief utilities, but there is another and not altogether unimportant item which has to be con-

sidered, viz., the skin. The operation of flaying should be performed as soon after the death of the animal as possible, for if it be delayed any length of time the hide may deteriorate in quality; this is sure to be the case if the goat dies from disease, and has been left till decomposition has begun to take place. To remove a skin properly requires some skill and care, so as not to cut it with the knife, and at the same time leave as little flesh and fat attached to it as possible. Those who are inexperienced in such work had better employ their butcher's slaughterman, who for a trifle will kill, flay, and cut up their goat in a workmanlike manner. When the skin has been taken off all the bits of flesh and fat adhering to it should be carefully removed with a knife, and the hide placed to dry, the hair side inward, in a covered airy place free from damp. To prevent it from shrinking, the head and tail ends should be stretched out and nailed on a board, and the leg parts spread out with skewers. Skins are sometimes preserved with salt and dried afterwards, but salt should not be used where it is intended to convert them subsequently into leather, as it never becomes thoroughly eradicated. The process of salting consists of laying the skins flat on the ground and well sprinkling the flesh side with salt, more particularly on the edges and spinal portions. They are then folded by being doubled, first lengthwise down the centre, and then one fold over the other until a square is formed; they will keep good in this manner for a considerable time, and may be dried afterwards.

Goatskins tanned and transformed into leather are valuable for the uppers of boots and shoes, being soft, elastic, and durable, resisting the damp. To procure the genuine article is, I believe, by no means easy, and when obtainable fetches a high price, being much dearer than ordinary calf, or what is commonly called kid. Persons keeping their own goats have therefore an advantage in this respect, their only difficulty being to get their skins tanned, most tanners refusing to take in the small number that a private individual has ready at a time; consequently, unless he has a friend through whom he can get them done, he is rather awkwardly placed. As for tanning them himself, it is entirely out of the question, the process being varied and complicated, requiring at the same time a considerable amount of skill; besides which, the cost of materials would, for the few skins to be tanned, be considerably greater than their ultimate value. To tan them roughly with the hair on, for mats and such purposes, is, however, more easy, and may be effected as follows:—First, soak them in water for about eighteen hours, to get rid of all dirt and blood, frequently working them about, to more thoroughly cleanse and soften them. They should next be scraped with a blunt thick-bladed knife and



thinned on the flesh side in order to remove as much as possible those portions of animal matters which are liable to putrefaction. After this they should be steeped for ten or fifteen days in a fermenting mixture of bran and water, composed of two pounds of bran to a gallon of water. On being taken out, they must again be washed, and then folded with the hair sides in contact and immersed for ten minutes in a solution of alum and salt, in the proportion of a pound and a half of alum and a quarter of a pound of salt to a gallon of water. The quantities given are sufficient for eight skins. They are then laid out and spread on the flesh side with a paste made by adding gradually to the last mixture, while constantly stirring, first a pound and a half of wheat flour, and subsequently the yolks of half a dozen eggs, afterwards incorporating the whole together. This paste has a softening effect upon the skins, making them also white, and counteracting any tendency to brittleness. They must be left in this state for eighteen or twenty hours, when becoming stiff they must be again rinsed in clean water, and dried by being stretched upon poles, and exposed in a dry loft, where they be left for a week or more as may be necessary. A finishing stroke may be given by polishing the skins with pumice, rubbed on as hard as possible, and finally ironing over with a smooth flat-iron carefully heated. Although this process effectually tans and preserves the skins, they cannot, of course, be expected to have that even, soft, and highly-finished appearance which those possess that are worked by a professional tanner. These effects are produced by a variety of instruments and tools, which an amateur does not possess, and which it would scarcely pay him to procure, such as fleshing knives, softening and stretching irons, beams, &c. Skins of goats with long hair may be improved, after the first washing and rinsing process has been gone through, by laying them out on a table or board and carding the hair with a coarse wool comb, paying particular attention to any dirty spots, which should be well washed with soap. The skin of an Angora, Cashmere or Thibet goat makes, when tanned, a most handsome mat.

Goatakins vary greatly in quality, according to the breed of the animal; those coming from cold climates being better, and consequently more valuable than those from southern latitudes. They are therefore adaptable according to the breed for different purposes; the hides of Swiss goats being most suitable for furniture and coachmaker's purposes; those of the Cape for boot uppers; those of the Angora and Cashmere for rugs, muffs, and trimmings; whilst those of the English and Irish varieties, although less valuable than the kinds previously mentioned on account of being more domesticated, are nevertheless also useful for boots, furniture, purses, &c. In consequence of goat skins taking a better dye than those

of other animals, they are used principally for the manufacture of morocco leather, for which purpose they are tanned and dyed in a peculiar manner. It is in the form of morocco that it is employed for most of the purposes just alluded to. The skins of kids, on account of their clear and beautiful texture, are peculiarly adapted for gloves and ladies' boots, and in some parts of the continent are even made into stockings and shirts.

The hair of the goat is manufactured in some countries into a strong though coarse kind of fabric, and worn as garments by the peasantry. That of the shaggy kinds, especially the males, is used for making barristers' and judges' wigs. It is also excellent for ropes that are to be used in water, as they last a considerably longer time than those made in the common way, never rotting from moisture. The hair may be shorn annually about the middle of May, in the same way as the wool from the sheep. Many goats have besides hair a very fine fleece, which on some individuals is very plentiful, coming off in the spring upon everything that the creature's coat touches. Although certainly not as valuable as ordinary wool, it is by no means useless, but the quantity on a single animal is, comparatively speaking, so small as to be scarcely worth collecting. In Russia it has long been employed for articles of dress, such as gloves, stockings, &c., and highly valued. It is stated that on one occasion a pound of this wool was sent from that country and woven with silk into a very beautiful shawl, the texture of which was greatly admired.

The horns of the goat have been converted by some people into handles for knives and such like tools. The suet, which is generally very abundant in a full grown and well conditioned specimen, in whiteness and quality is said to be vastly superior to that of the sheep or ox, or in fact of any other animal.

## CHAPTER VIII.

### DISEASES.

It is somewhat surprising, considering the close resemblance that exists in a physical point of view between the sheep and the goat, that the one should be so much less liable to disease than the other, but such is the case. The disorders of sheep are many and various, as most people know ; the goat, on the contrary, is subject to few, those few, however, being of the same class and character as in the former. Taking domestic animals generally, I should think there is scarcely any that suffer less from disease than the goat, which, if well housed with good ventilation, having sufficient food, and a constant supply of salt as I have directed, may go all its life without requiring a dose of physic. As, however, proper care is not always bestowed upon domestic animals, especially pets, which at first are oftentimes pampered, and afterwards neglected, it does sometimes happen that disease overtakes them. I purpose, therefore, in this chapter giving a description of those disorders to which goats are liable, and adding a few simple remedies for their cure. An elaborate medicine chest is in this case not necessary, most of the ailments yielding to a dose or two of Epsom salts, ginger, &c.

### DIARRHŒA AND DYSENTERY.

The outward appearance of these disorders being very similar, I class them together, although in reality they differ materially, the former meaning simple purging, and being a natural effort of the bowels to get rid of irritating matter ; whereas the latter consists in inflammation of the mucous membrane of the intestines, causing violent purging, and accompanied generally by fever. As dysentery frequently results from neglected diarrhœa, it is well not to allow the latter to continue too long before adopting remedial measures. It often happens, however, that a cure is effected, if taken in hand early, by simple change of food, or even of

pasture; should this have no effect then medicine must be administered. I have found this disorder most prevalent with kids, especially about the period of weaning; and the treatment that I have pursued with success is that recommended by Mr. Stephens in his "Book of the Farm," for the skit in lambs. It consists of an aperient combined with a gentle tonic, and may be made by mixing together  $\frac{1}{2}$ oz. of Epsom salts with  $\frac{1}{2}$  drachm of ginger, to which is added one tablespoonful of sheep's cordial, consisting of equal parts of brandy and sweet spirits of nitre. This is to be given when the evacuations are of a yellowish white appearance. When, however, they are dark green, or still worse, black, in which case the matter is more serious, give an ounce of castor oil with a teaspoonful of oil of turpentine. Should the diarrhoea be but slight, and the creature lively, with its usual appetite, no notice need be taken of it; but when the reverse is the case then physic should be given without delay. For full-grown goats, if the purging be considerable, give  $\frac{1}{2}$ oz. of prepared chalk, with two grains of opium, in a pint of warm milk, and repeat the dose in two days if the disorder continues.

In dysentery the discharges are thin and slimy, being frequently mixed with blood and hard lumps, and very offensive; the creature becomes weak and emaciated, and generally refuses food. This disease may be brought on from the goat eating decayed and decomposed vegetables, or results from neglected diarrhoea. The animal must be kept warm in the stable, and have a good bed of straw and plenty of hay. If it refuse the hay, as it probably will if very ill, gruel must be administered to it. In the way of physic,  $\frac{1}{2}$ dr. of rhubarb with 1oz. of Epsom salts, or 2oz. of linseed oil with 2gr. of opium in half pint of linseed tea, must be given to clear the bowels, and then the following mixture to act as an astringent: Prepared chalk, 1oz.; powdered catechu,  $\frac{1}{2}$ oz.; ditto ginger, 2dr.; ditto opium,  $\frac{1}{2}$ dr.; peppermint water, half pint. Mix these ingredients well together, and give from one to two teaspoonfuls twice a day, shaking the bottle previously. Afterwards a tonic, composed of powdered gentian and ginger, commencing with  $\frac{1}{2}$ dr. of the former and 1scr. of the latter, and terminating with four times these proportions given in water, is valuable to restore and strengthen the system.

#### CONSTIPATION.

Constipation of the bowels only appears to any extent in kids, and, like diarrhoea, occurs mostly after weaning, when the stomach receives a change of food. It is not often dangerous, however, and will generally yield to a mild aperient in the form of an ounce of common salt, or, to one slightly stronger, as  $\frac{1}{2}$ oz. Epsom salts, either administered in a quarter of a

pint of warm water or gruel. The diet should be of a relaxing character, and particular care taken to have plenty of rock salt accessible to the animals to lick.

#### CATARRH OR INFLUENZA.

Goats that have been accustomed to be pampered and kept constantly in warm stables, have not very often that hardy constitution which those possess that spend their lives on mountains and commons. Such animals not unfrequently suffer, if much exposed to damp and cold, from disease of the bronchial tubes and affections of the respiratory organs. The symptoms of catarrh are a heavy discharge from the nose and eyes, accompanied by sneezing; the eyes having frequently a bloodshot appearance. With bronchitis there is considerable difficulty in breathing, and a wheezing cough is present. The treatment consists in keeping the animal warm, feeding it on gruel and mash, which, with a few doses of Epsom salts and ginger, will generally effect a cure. The proportions are about 2oz. of Epsom salts to 1½ drachms of ginger.

#### FOOT-ROT.

When kept much on low, wet ground, goats are liable, like sheep, but less frequently, to attacks of this disease, in which the hoof outgrows its natural proportions, not having that friction which on rocks and hard ground wears down the horn as it forms. The outer portions of the hoof outgrowing the inner parts, or frog, the former extends over the latter, which becomes soft, cracks and lets in dirt and sand, which penetrate to the quick, causing great irritation and often ulceration. Inflammation then sets in, the coronet swells, and portions or sometimes even the whole of the hoof becomes dead and breaks away. If taken in time this disease may be treated successfully, but the task is a troublesome one and unpleasant to perform. The hoof must be well pared, cutting deep, and removing every part of the diseased horn, and afterwards well cleaned of all dirt, washed with chloride of lime, and bound up with tow and rags. A poultice of linseed may be applied for one or perhaps two days, but this is rather difficult; after which the following application is recommended: Sulphate of copper, 4oz.; sugar of lead, 2oz.; verdigris, 3oz.; saltpetre, 2oz.; turpentine, ½ pint; oil of vitriol, 10oz. (by weight); water, 1 pint. It is almost needless to add the goat must be kept in a dry place, and the foot dressed daily. Some recommend medicine to be given internally, at the commencement of the treatment, and administer Epsom salts, 3oz.; sulphur, 1oz. Foot-rot is a disease, however, which may be prevented by occasionally examining the hoofs and paring away any horn that has exceeded its ordinary proportion.

## GARGET.

Garget, black garget, or inflammation of the udder, is a serious ill, and if not taken in hand early and properly treated, is very likely to end fatally. It may be brought on from the goat getting chilled by lying on damp, cold ground after kidding, or it may result from sore teats that have been neglected. The first symptom of this disease is the refusal on the part of the mother to allow her young to suck. When this is noticed the udder must be examined, and if the part feels hot and hard, it is a further sign. The goat must be separated from the kid and kept shut up in a warm, well-sheltered place. A dose of Epsom salts should be administered and the udder freely bathed with hot salt and water. After which the following ointment may be used with advantage upon the affected part:—Camphor, powdered by means of a drop or two of spirit of wine, 2dr.; mercurial ointment, 2dr.; elder ointment, 2dr. Incorporate the ingredients thoroughly. If this does not arrest the disorder, but the udder turns black, the lancet will be required to be used, and some blood drawn, in which case the services of a veterinary surgeon had better be obtained.

## SORE TEATS.

The teats of a goat are sometimes attacked with sores and ulcers, rendering both milking and the natural suckling of the kid most painful operations. The soreness is generally produced by the kid biting the teat, but other, and probably constitutional causes may bring it on. Although it may be considered a comparatively unimportant affair, it nevertheless requires attention, or, like other simple disorders, it may, if neglected, lapse into a more serious evil. The kid not being able to suck, the milk accumulates in the udder, and, as I just remarked, garget may ensue. The young goat must be temporarily removed from its mother, and fed by hand until the latter is able again to suckle it. The teats should be dressed with the following ointment: Goose grease, 8oz.; camphorated spirits of wine, 2oz.; common salt, 2oz. In mild cases, where they are but slightly cracked, goose grease alone will often effect a cure. The milk must be drawn off twice daily, but the operation should be performed as gently as possible.

## POISONS.

Although goats will consume with impunity many herbs, which if eaten by other animals, would rapidly cause death, there are, nevertheless, a few which are equally injurious to them—amongst these are the leaves of the yew, which, if taken in any quantity, will cause violent sickness, especially when the branches are dead. If given at once, the poison may

be got rid of by administering strong doses of purgative medicine, such as linseed or castor oil, but a more effectual remedy, especially in bad cases, is the stomach pump.

#### LICE.

These are a disgusting and troublesome pest, and with goats that are much petted by children, especially objectionable. They often appear in large numbers in the hair of goats or kids that have got into a low and poor condition from insufficient food or sickness. A good and simple remedy is to sponge the animal thoroughly with tobacco water, to which a little spirits of tar has been added, the proportion being a wineglassful of the latter to a quart of the decoction of tobacco. Mercurial ointment, diluted with seven parts of lard, is a very certain killer of these vermin, but it is a nasty process and a dangerous one, the ointment being very poisonous. An indiarubber syringe, charged with some insect destroying powder, such as that sold by Keating, which on pressure is blown into the hair of the animal, has been employed with advantage in some cases. If goats are properly fed and cared for, however, and their coats frequently brushed and occasionally combed out, such vermin will never exist.

#### ADMINISTERING MEDICINES.

A few words of advice on this subject may be useful, as much depends for success upon the manner in which medicines are administered. Those of a fluid consistence (and they should nearly always be administered in this form) should be made to trickle down the gullet as slowly and gently as possible, for, if poured hastily into the animal's throat, instead of remaining in the fourth stomach or abomasum, as it should do, it passes into the rumen, where it lies inert, and is therefore comparatively useless. A drench is the proper utensil to employ in administering fluids, but an old teapot with a small spout answers the purpose very effectually. I have had goats which would drink castor oil, linseed tea, or gruel like water, but such accommodating animals are rare.

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